

FIG. 1

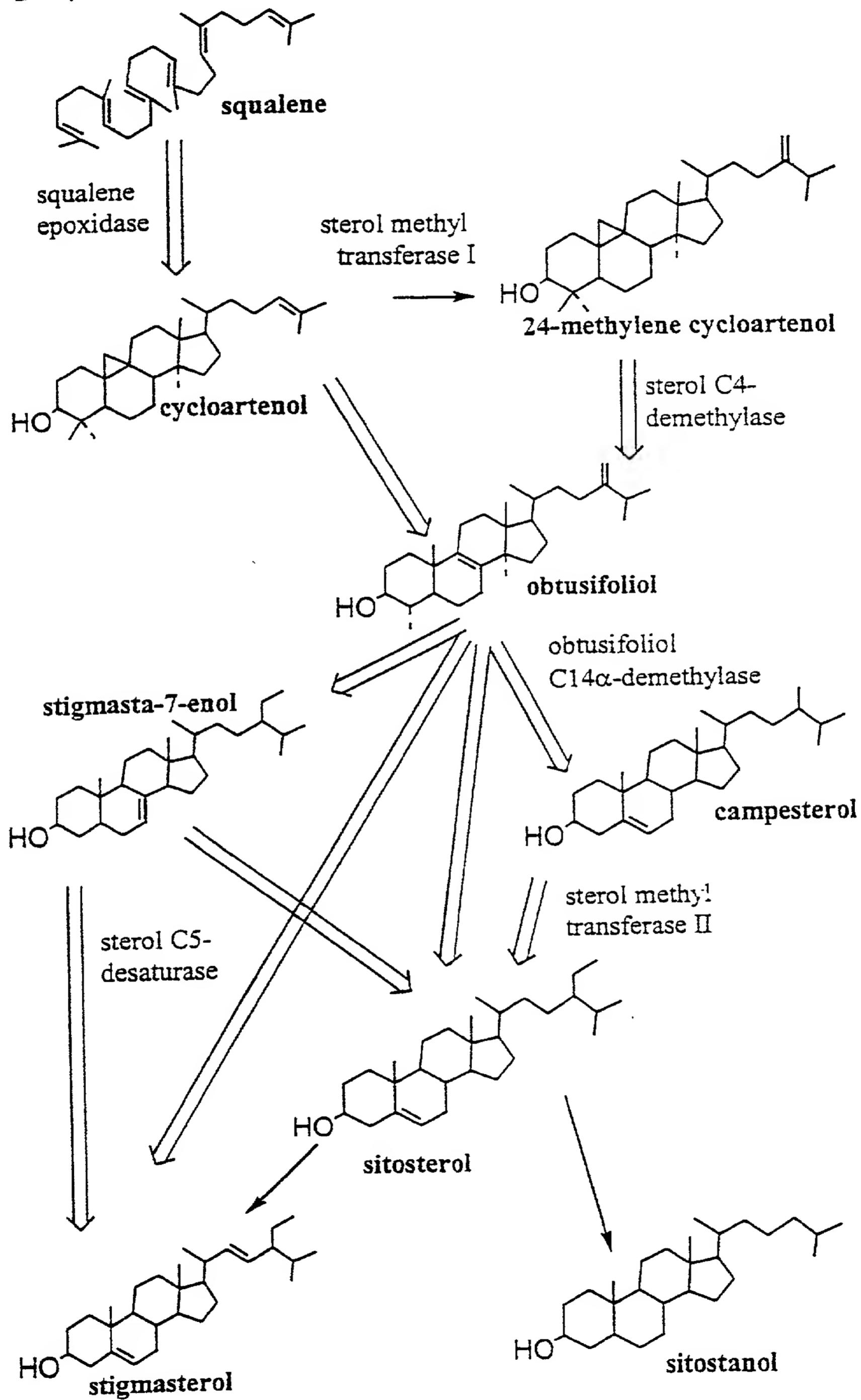
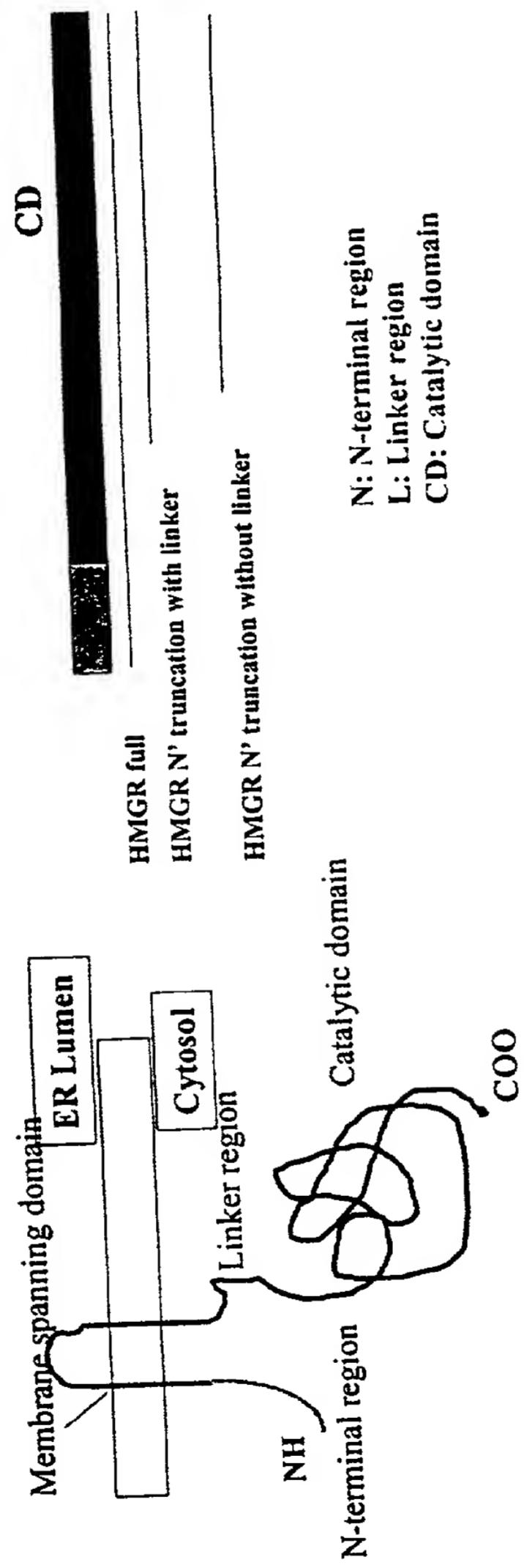


FIG. 2



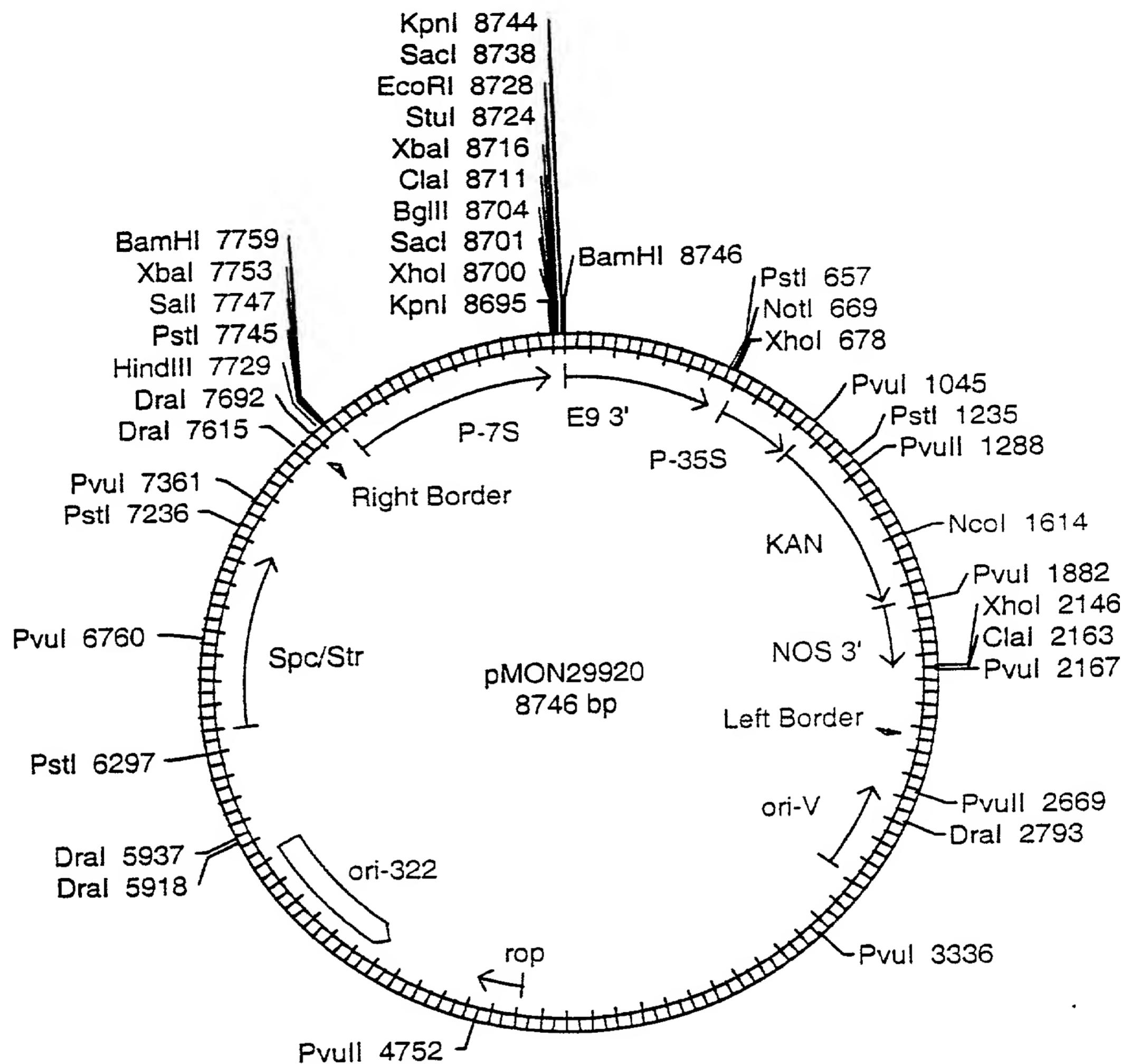


Figure 3: Construct pMON29920

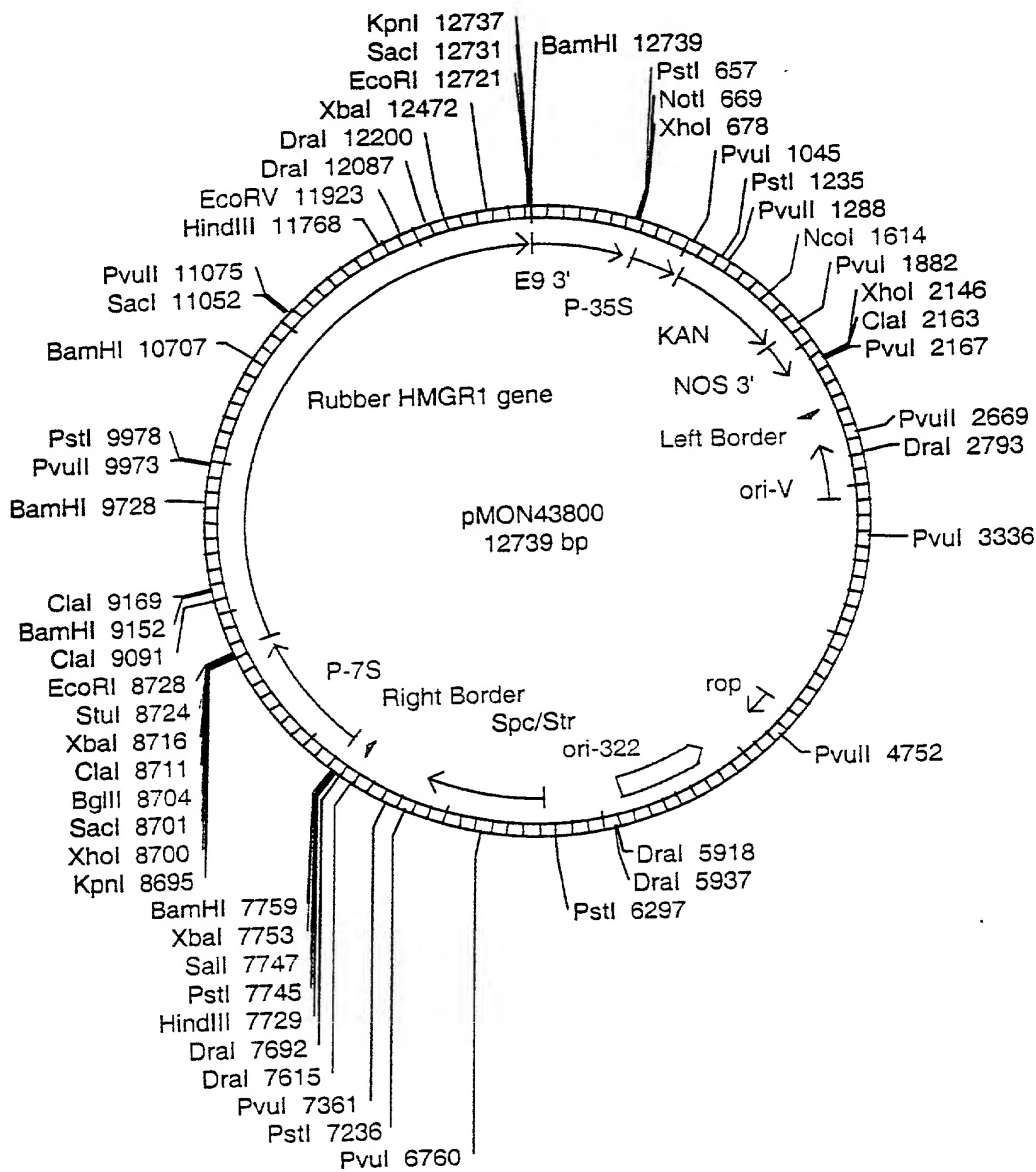


Figure 4: Construct pMON43800

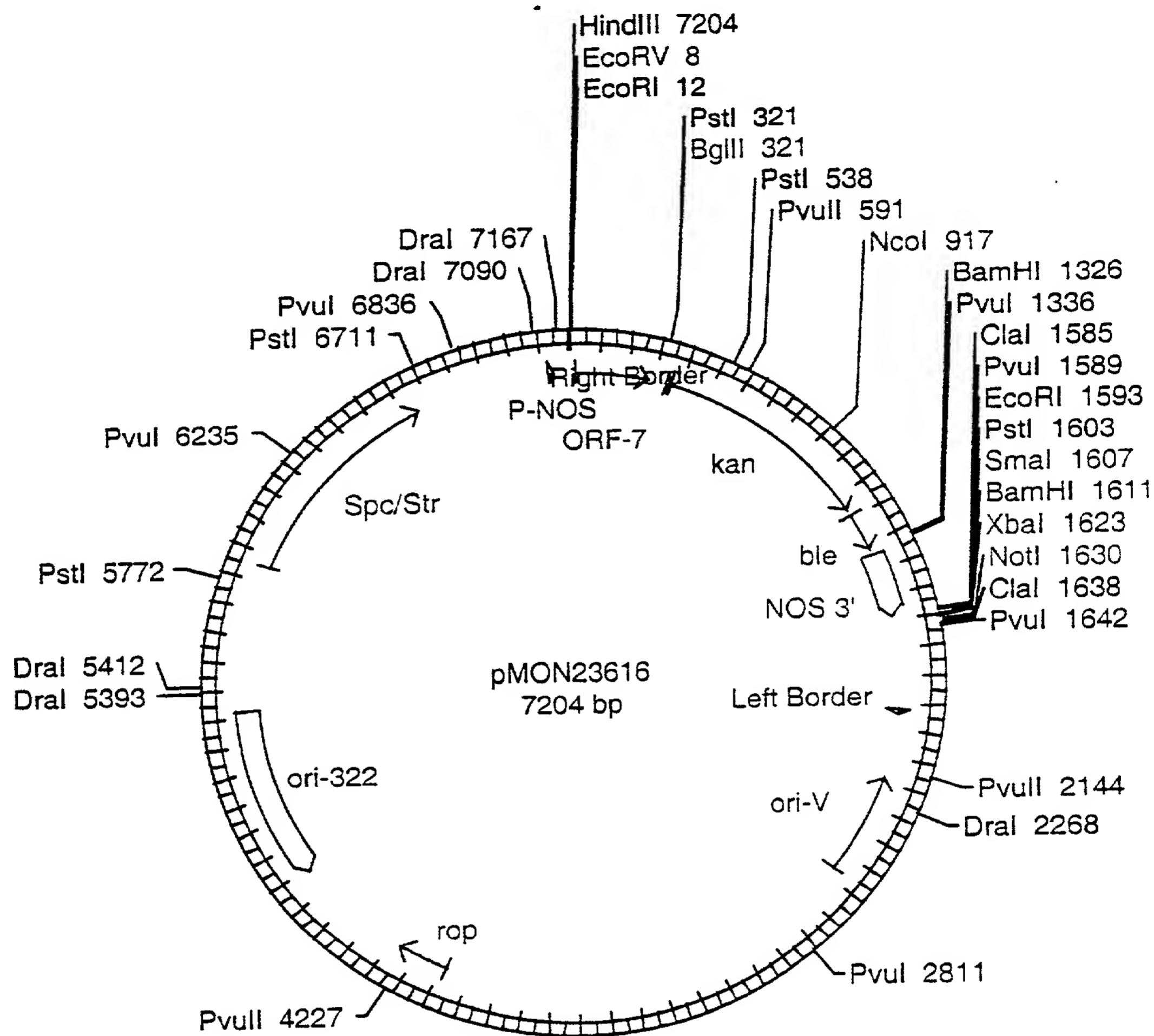


Figure 5: Construct pMON23616

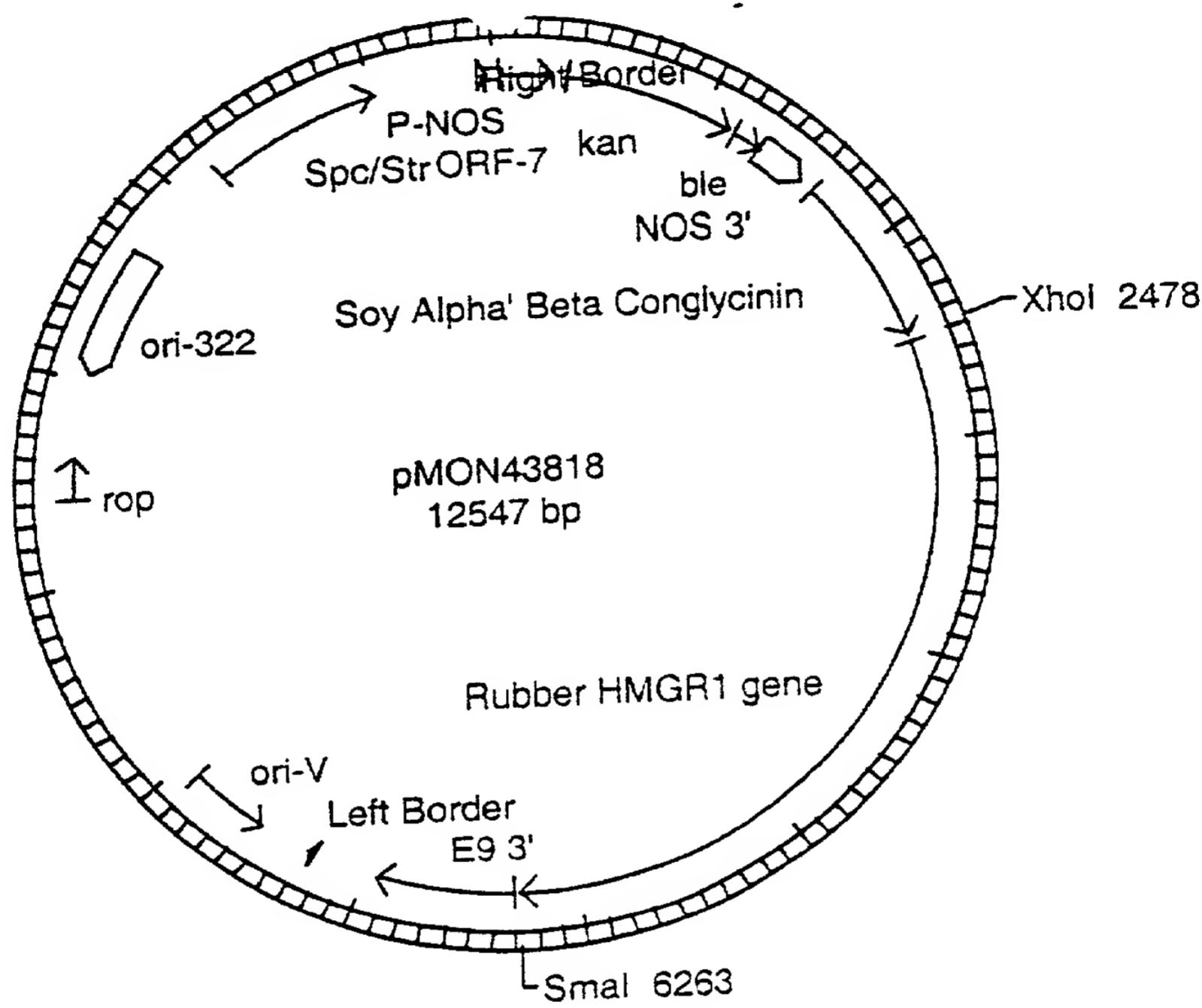


Figure 6: Construct pMON43818

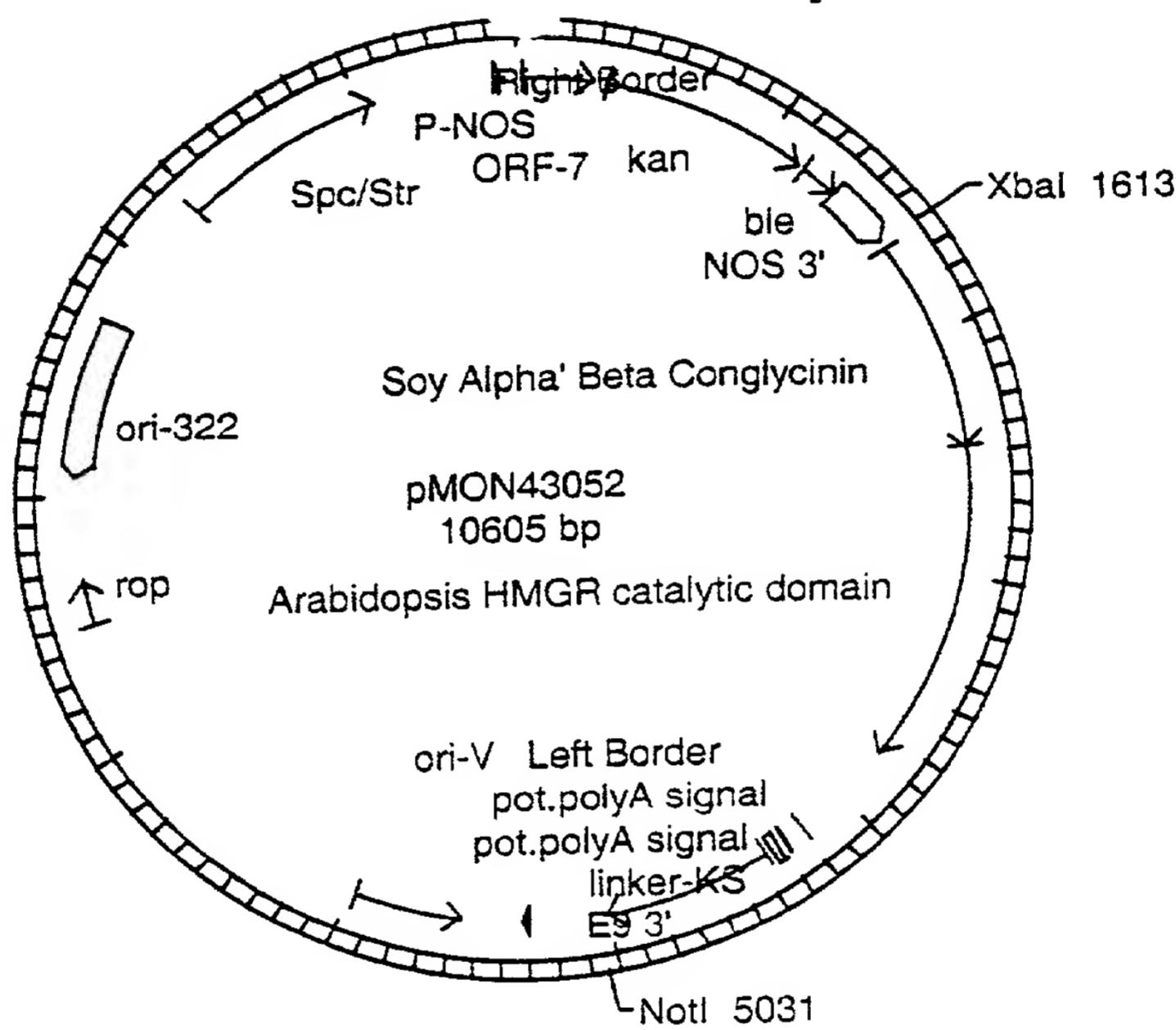


Figure 7: Construct pMON43052

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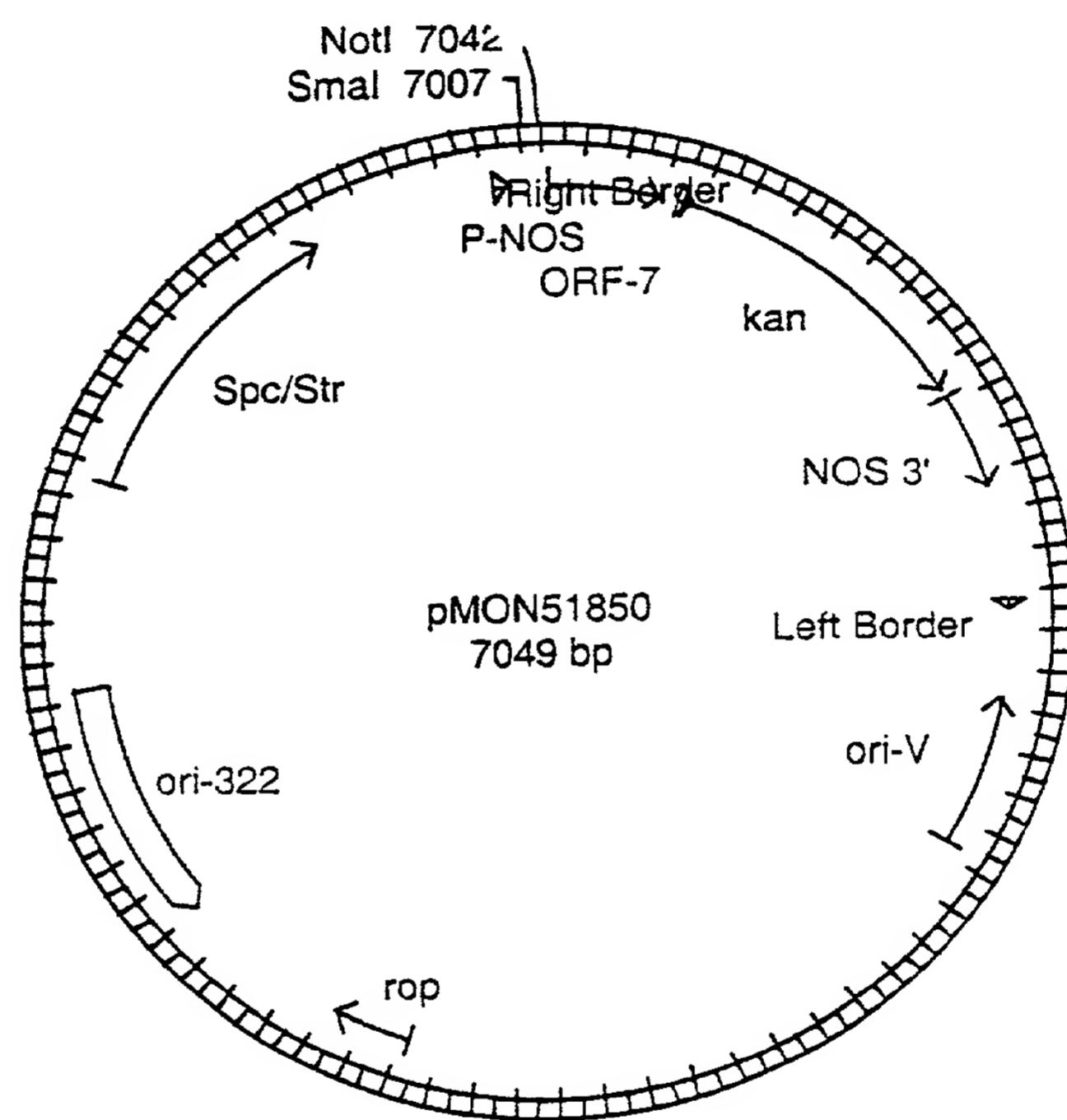


Figure 8: Construct pMON51850

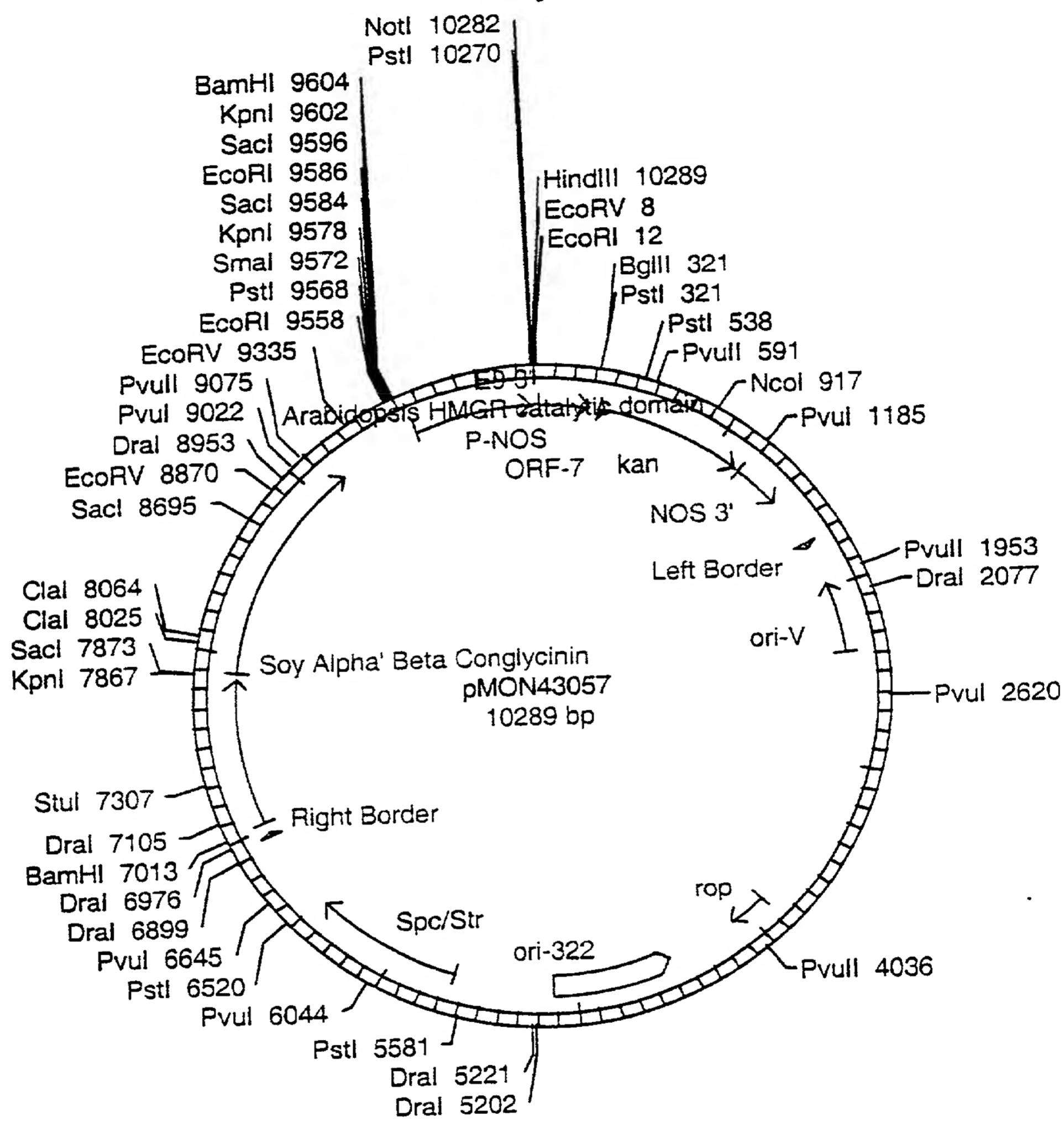


Figure 9: Construct pMON43057

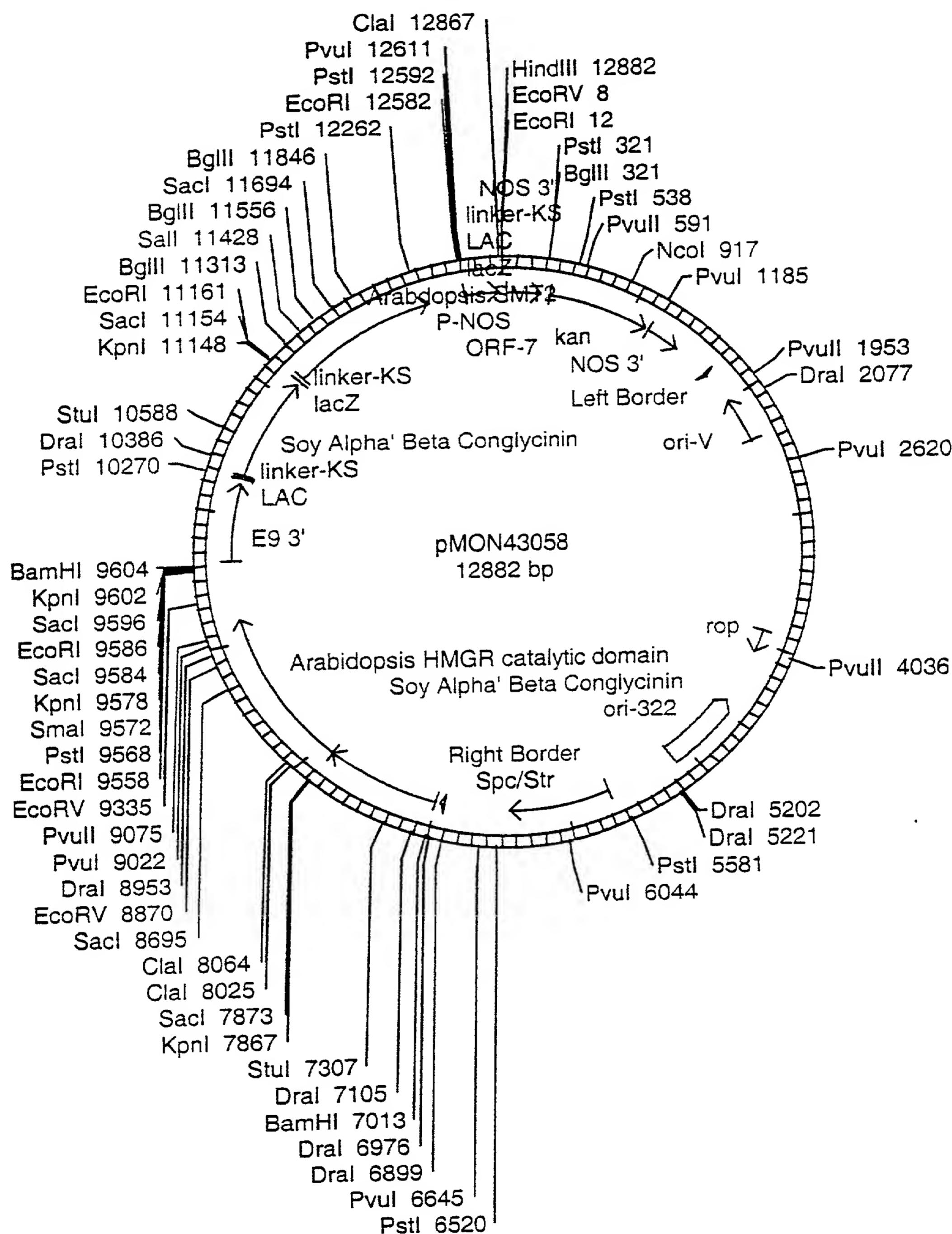


Figure 10: Construct pMON43058

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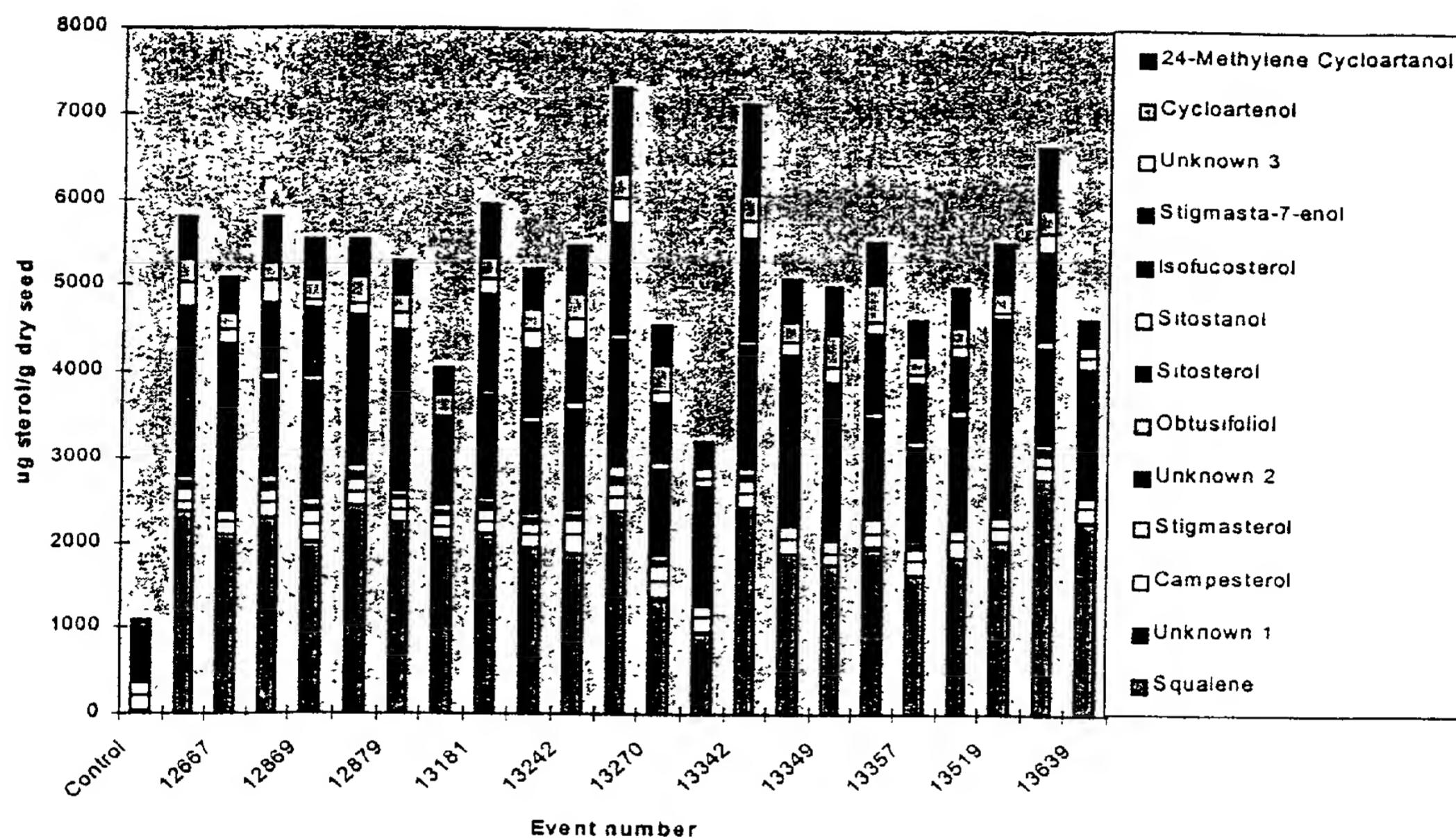
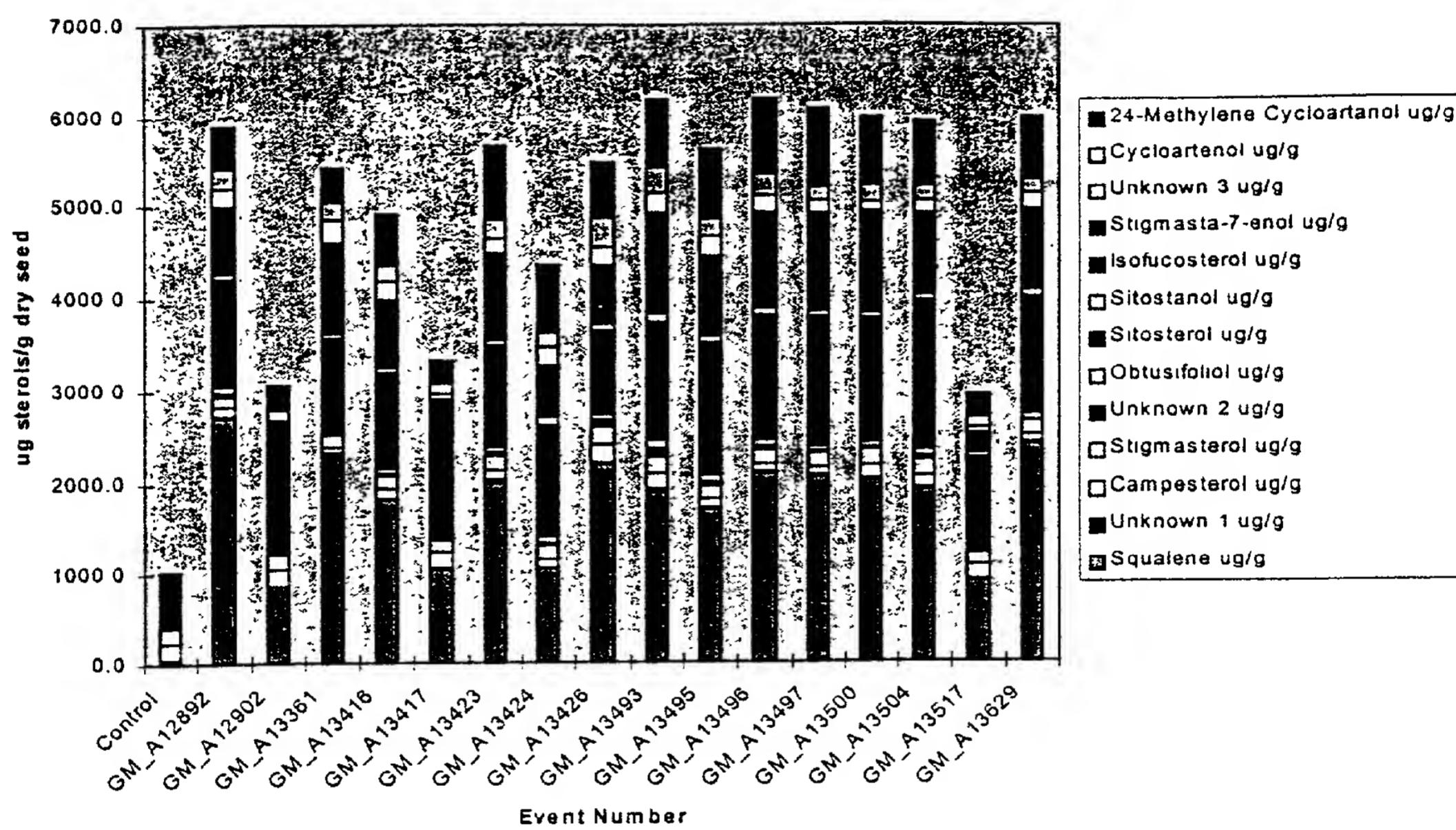


Figure 11: Sterol composition of R1 transgenic soybean seeds when *Arabidopsis* truncated HMGR (catalytic domain without linker) was overexpressed using seed-specific 7S promoter ( data from pMON43057: p7s::At HMGR truncated).

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**Figure 12: Sterol composition of R1 transgenic soybean seeds when *Arabidopsis* truncated HMGR (catalytic domain without linker) and *Arabidopsis* SMTII were overexpressed (data from pMON43058: p7S::*At* HMGR truncated & p7S::*At* SMTII). The expression of the genes is controlled by the seed-specific 7S promoter.**

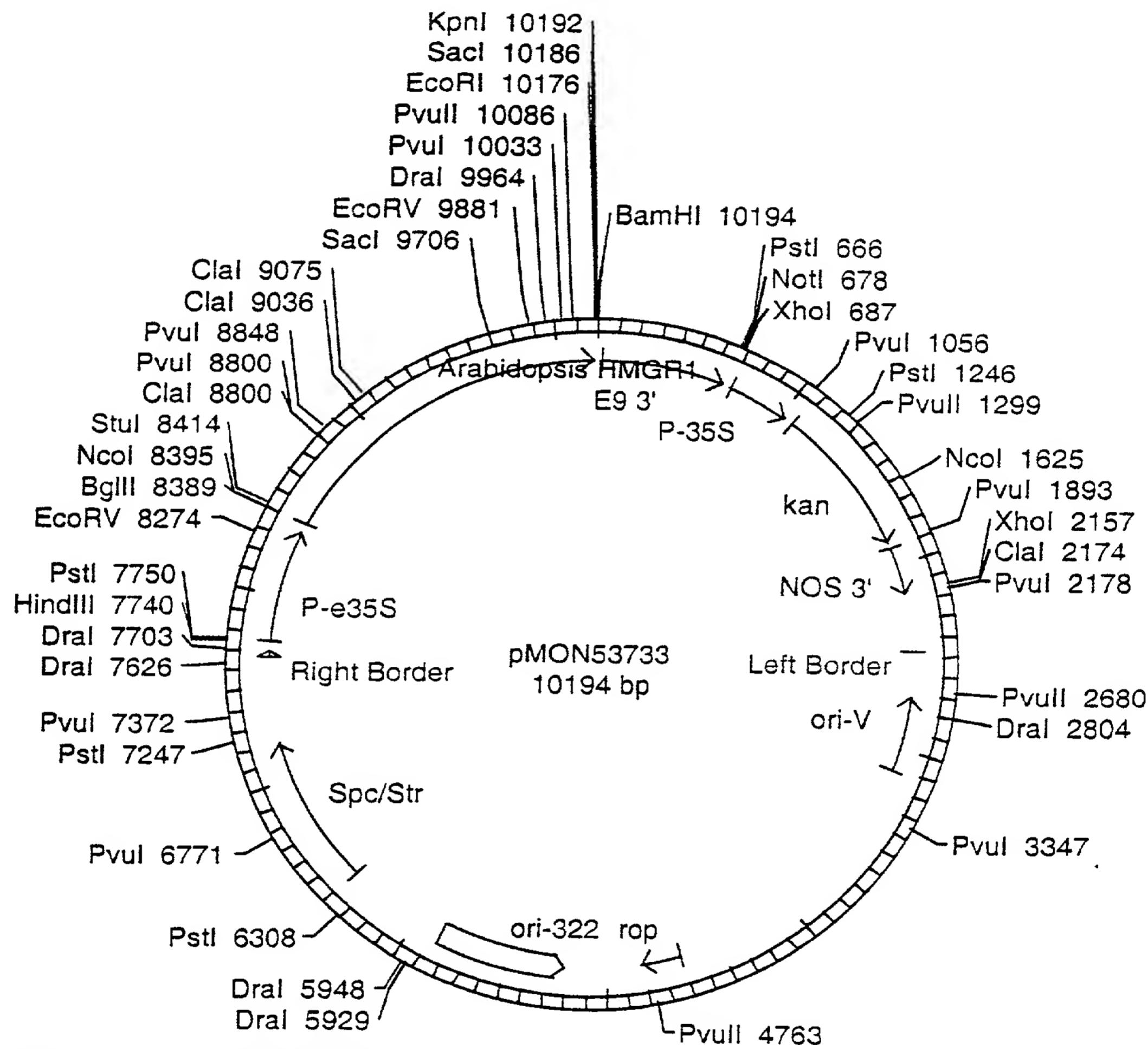


Figure 13: Construct pMON53733

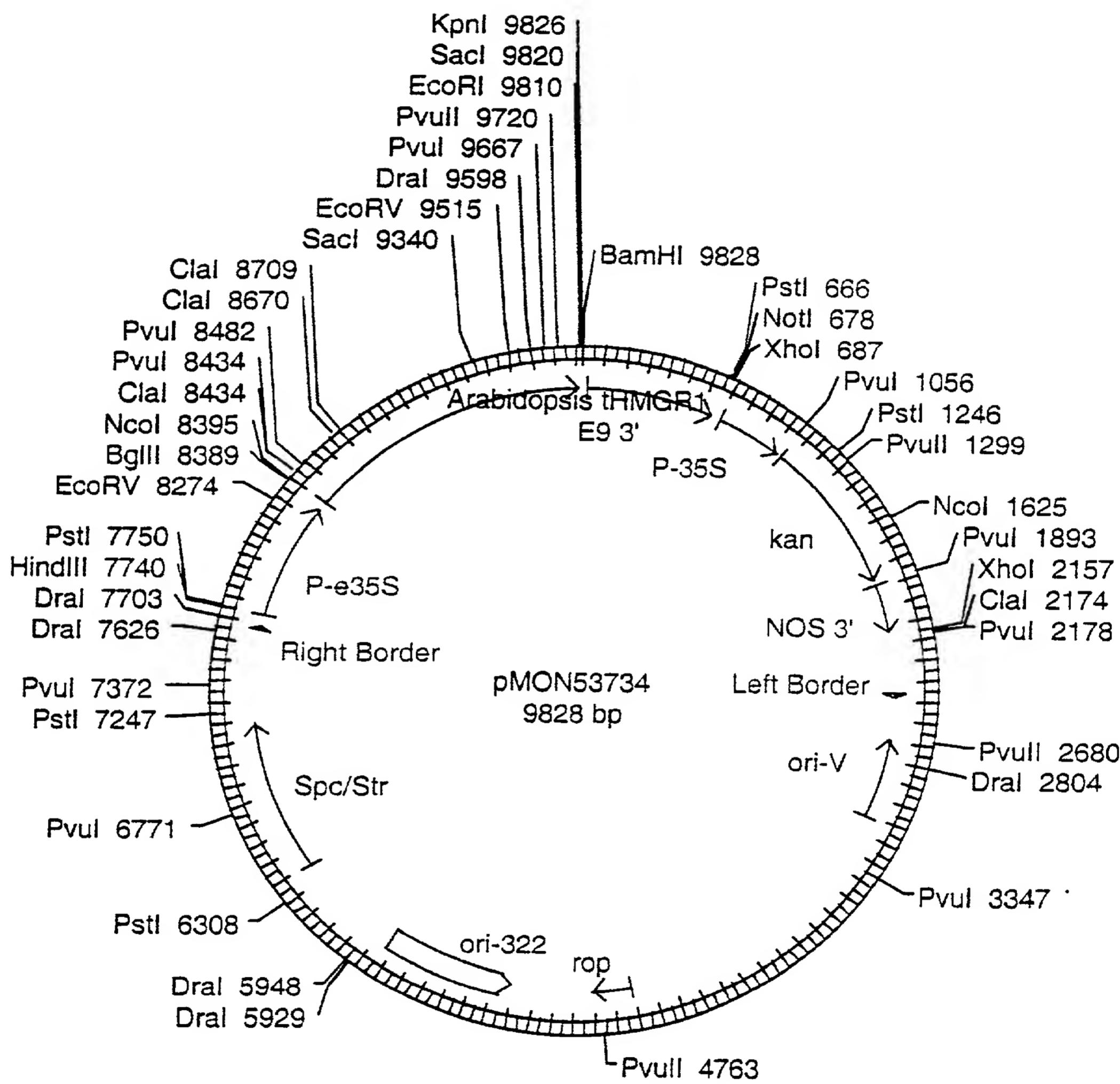


Figure 14: Construct pMON53734

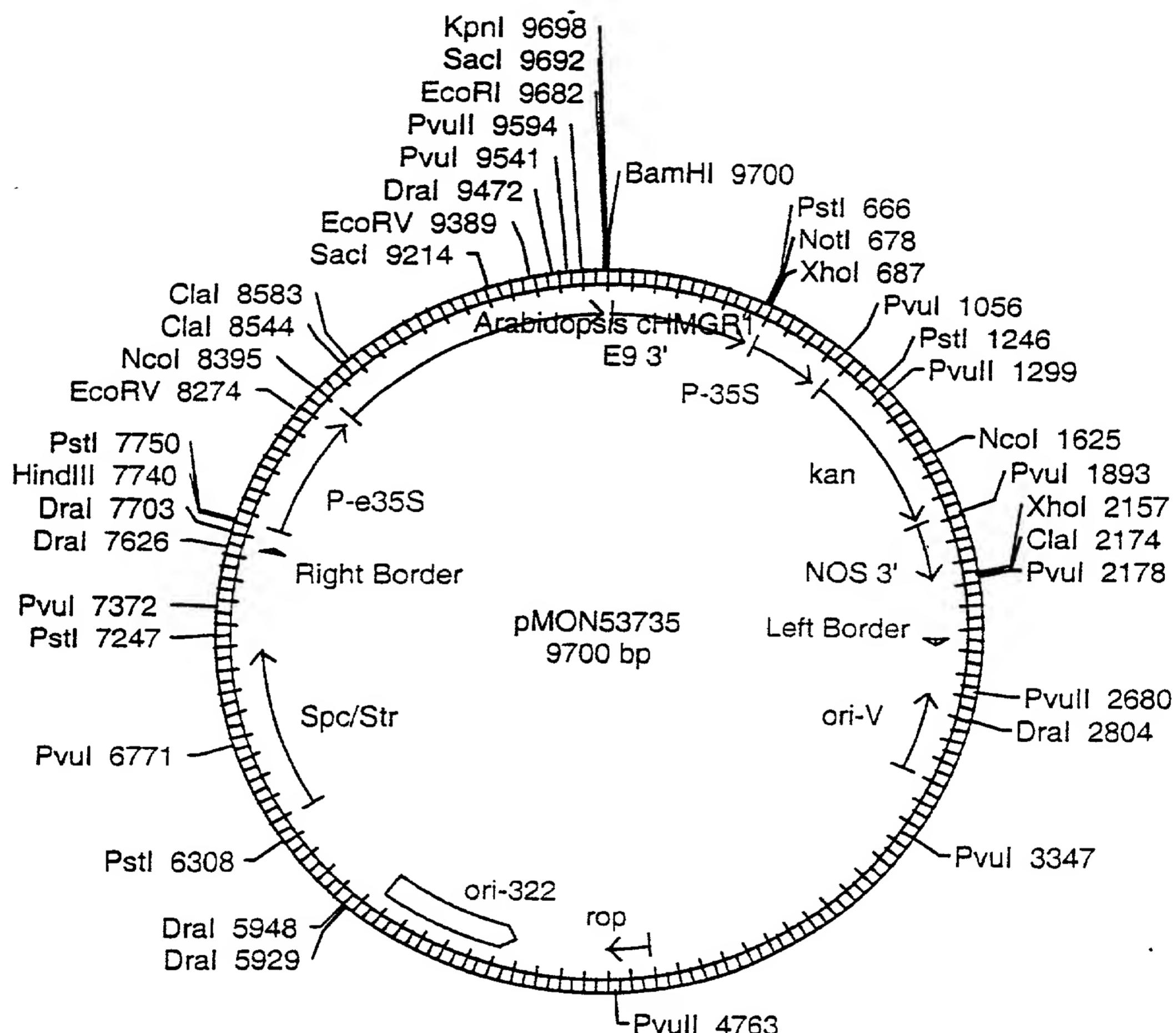


Figure 15: Construct pMON53735

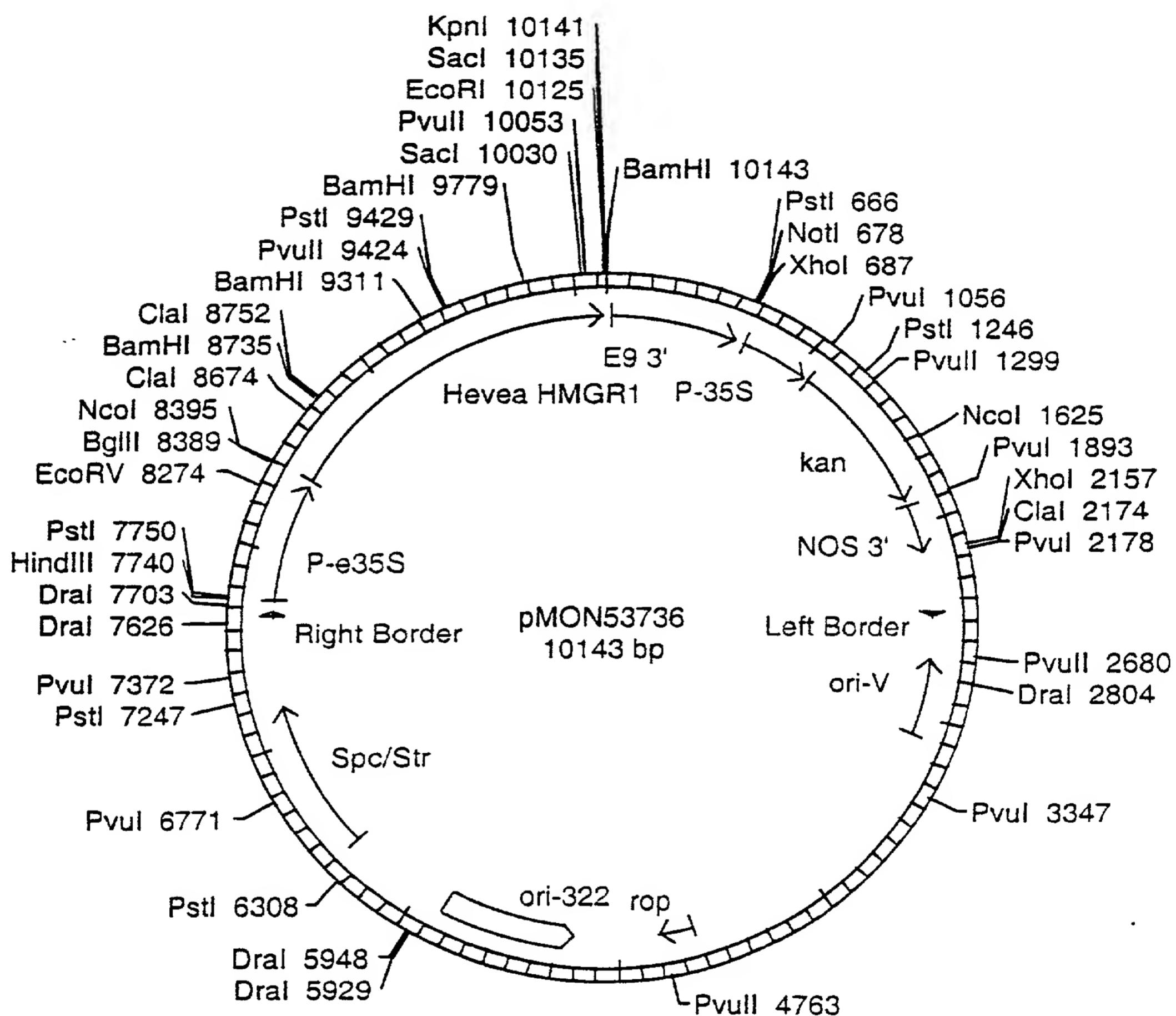


Figure 16: Construct pMON53736

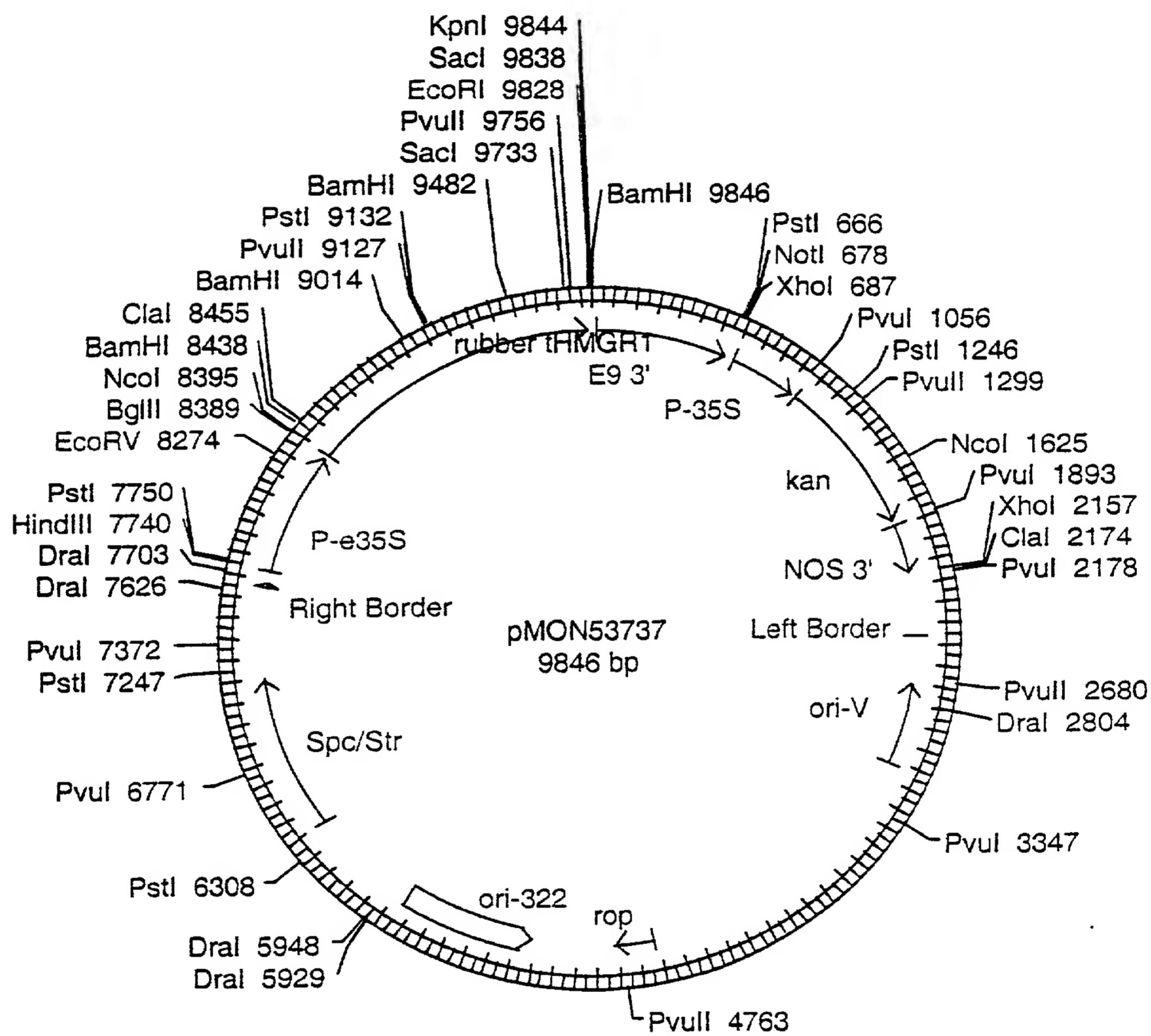


Figure 17: Construct pMON53737

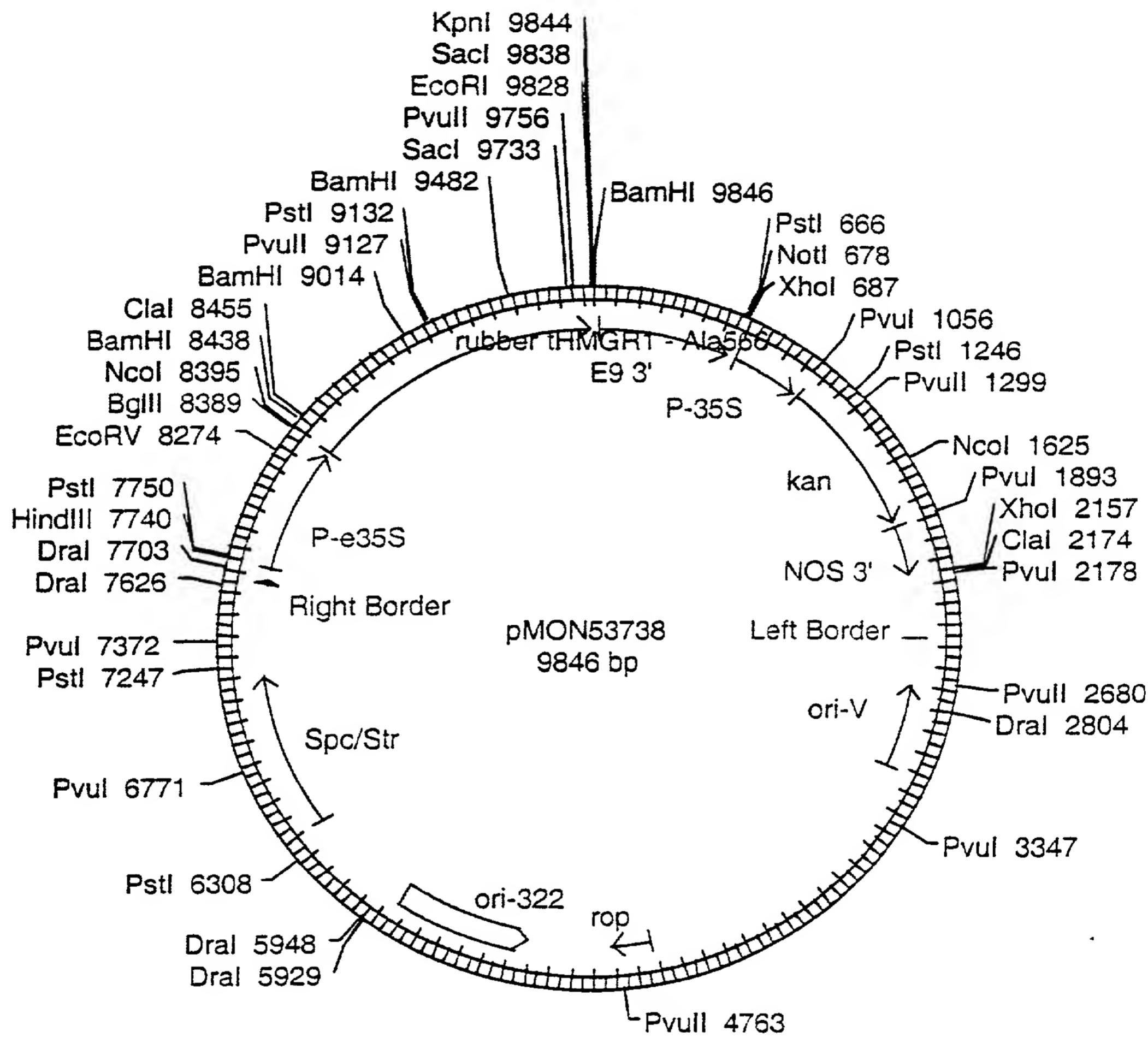


Figure 18: Construct pMON53738

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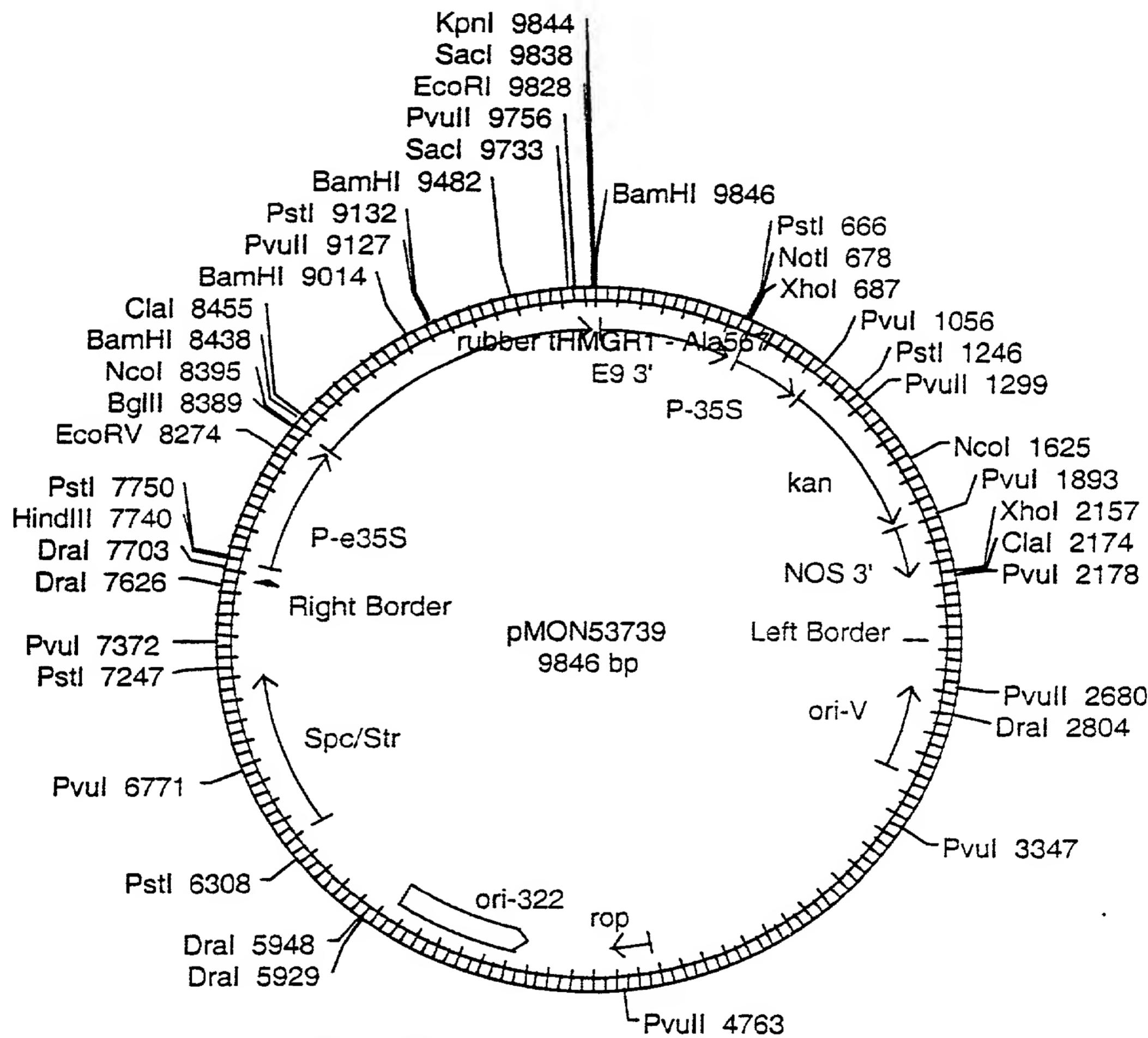


Figure 19: Construct pMON53739

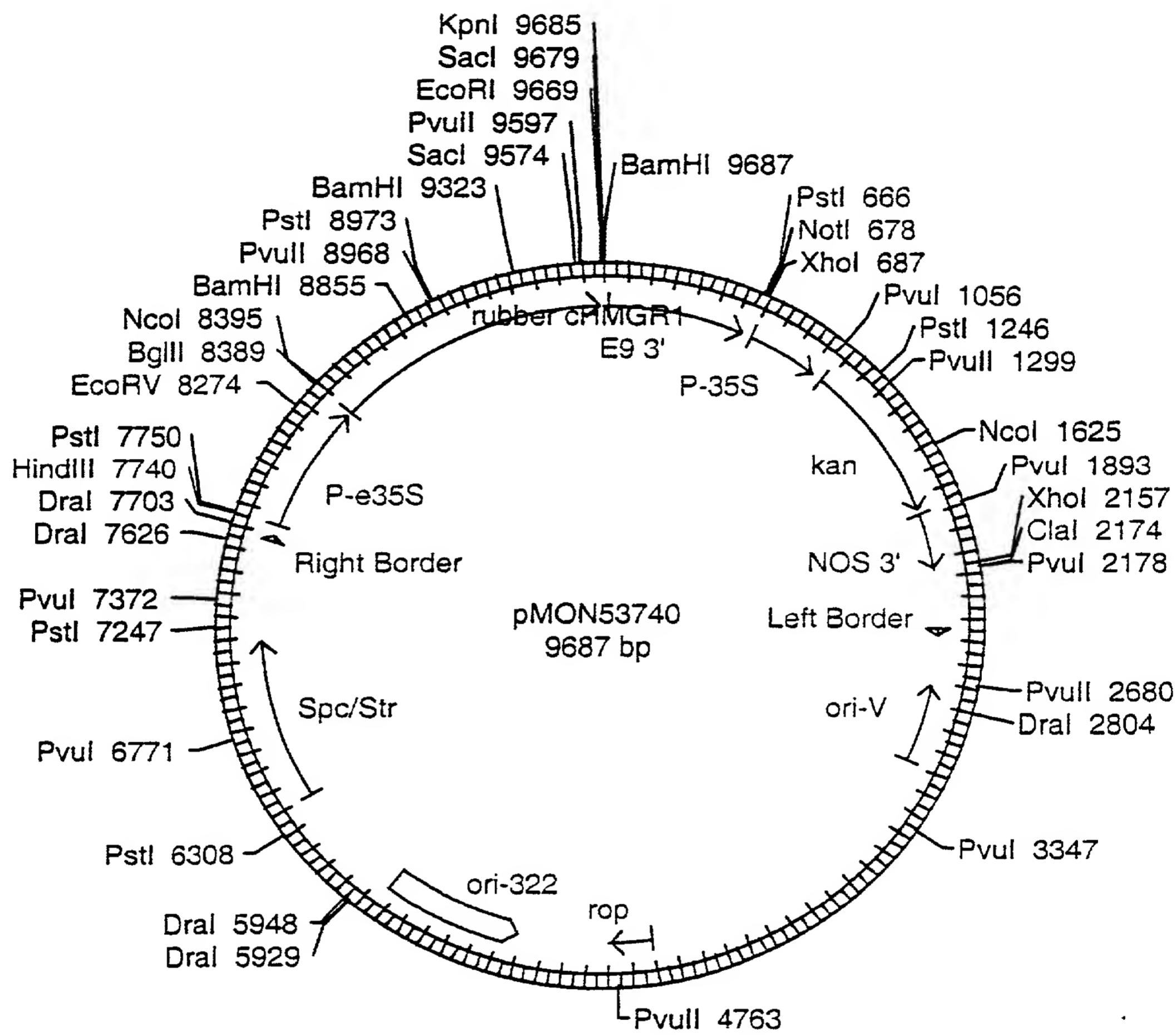


Figure 20: Construct pMON53740

FIG. 21

### Comparison of Cycloartenol Levels in Transgenic Plants

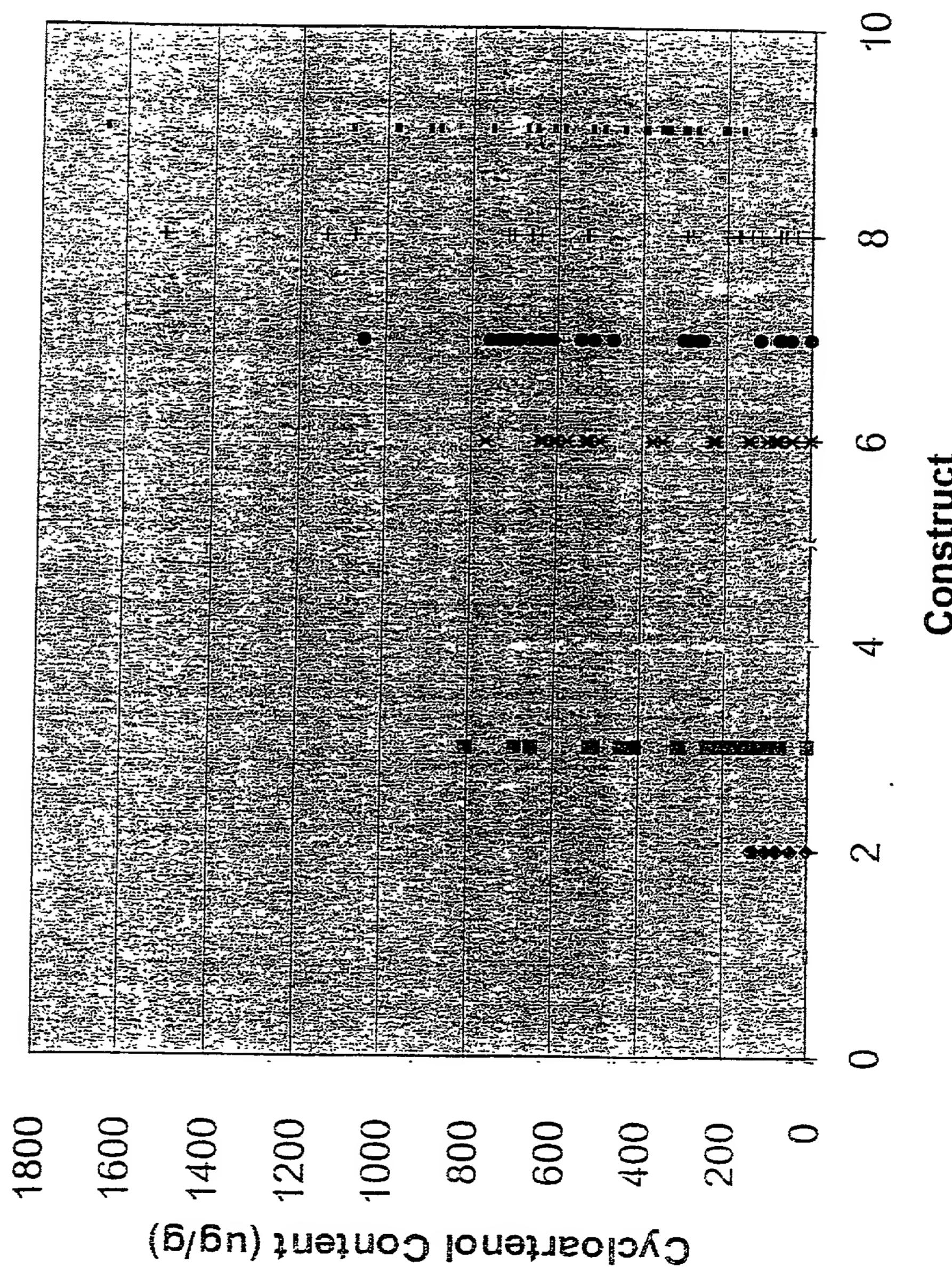


FIG. 22

### Comparison of 24-Methylene Cycloartenol in Transgenic Plants

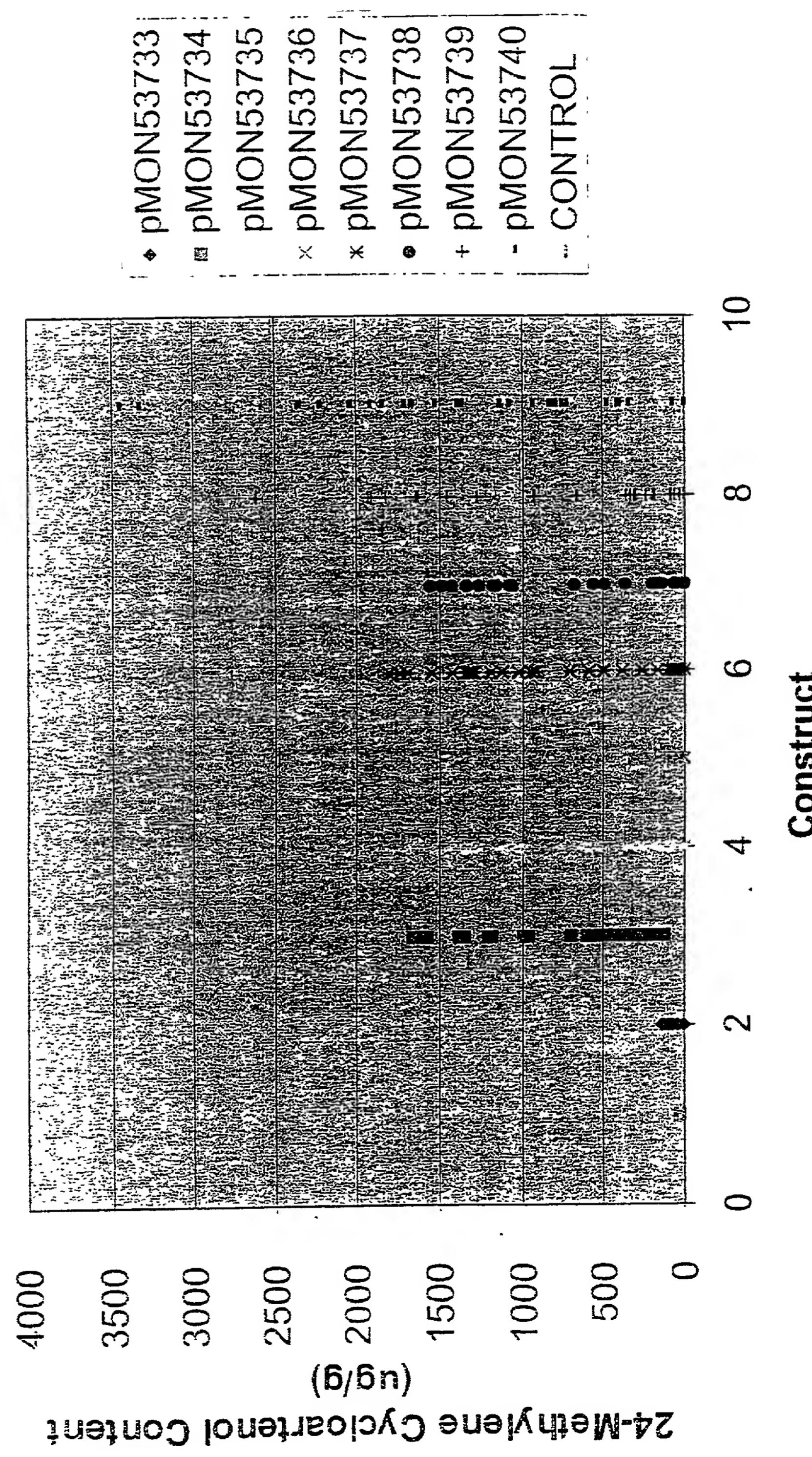


FIG. 23

Comparison of *Obtusifolol* Levels in Transgenic Plants

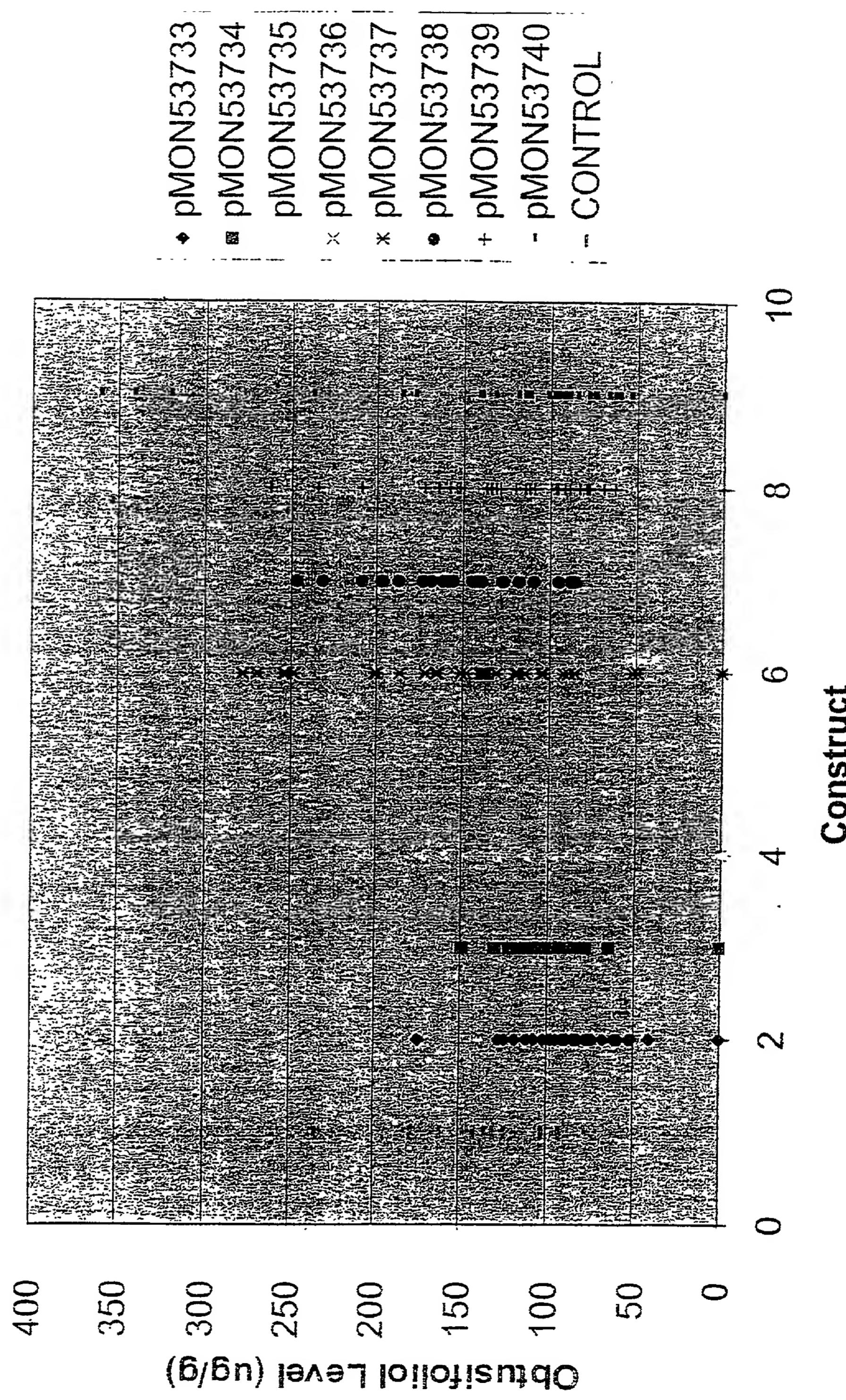


FIG. 24

Comparison of Campesterol Levels in Transgenic Plants

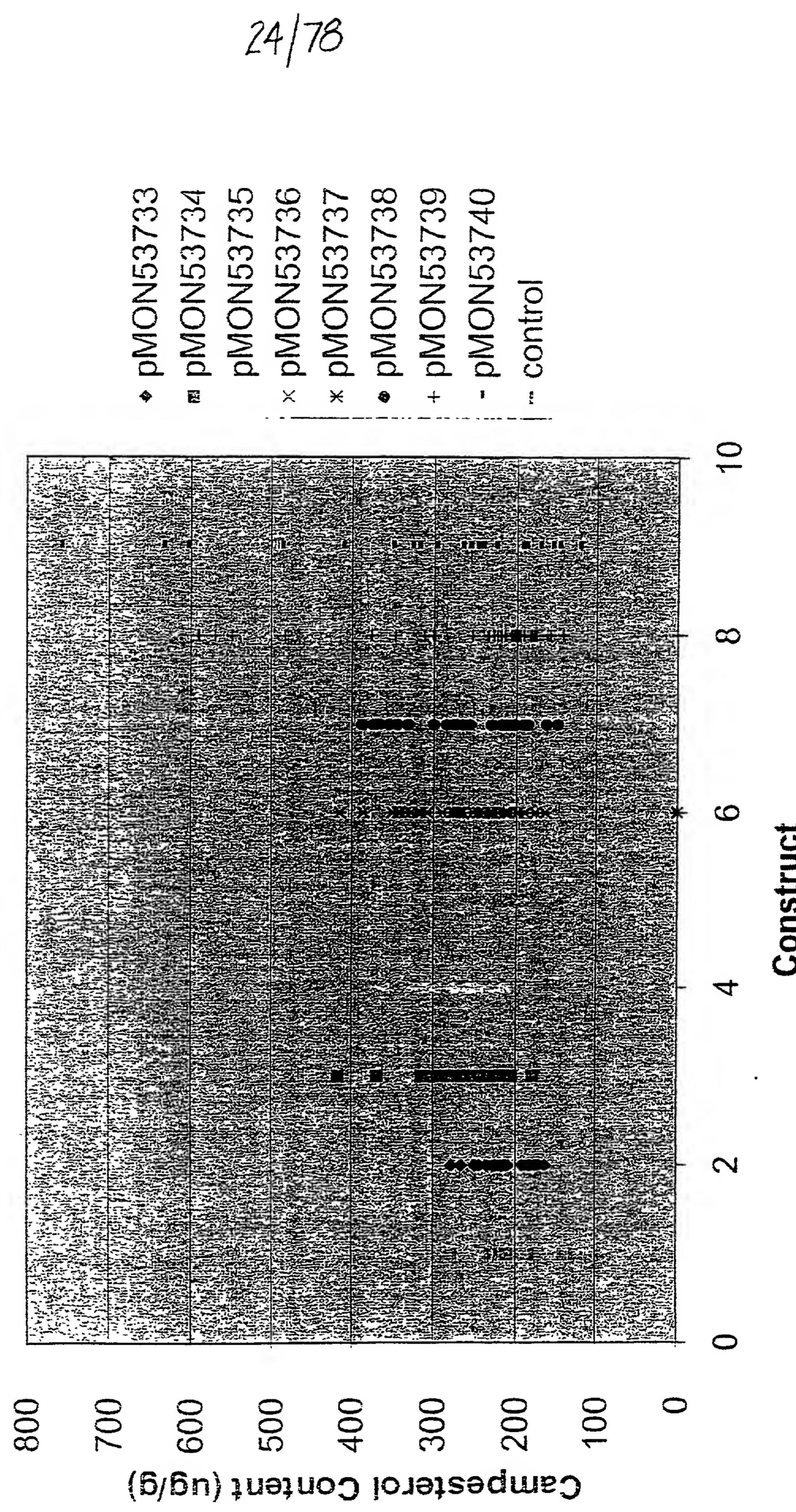


FIG. 25

Comparison of Sitosterol Levels in Transgenic Plants

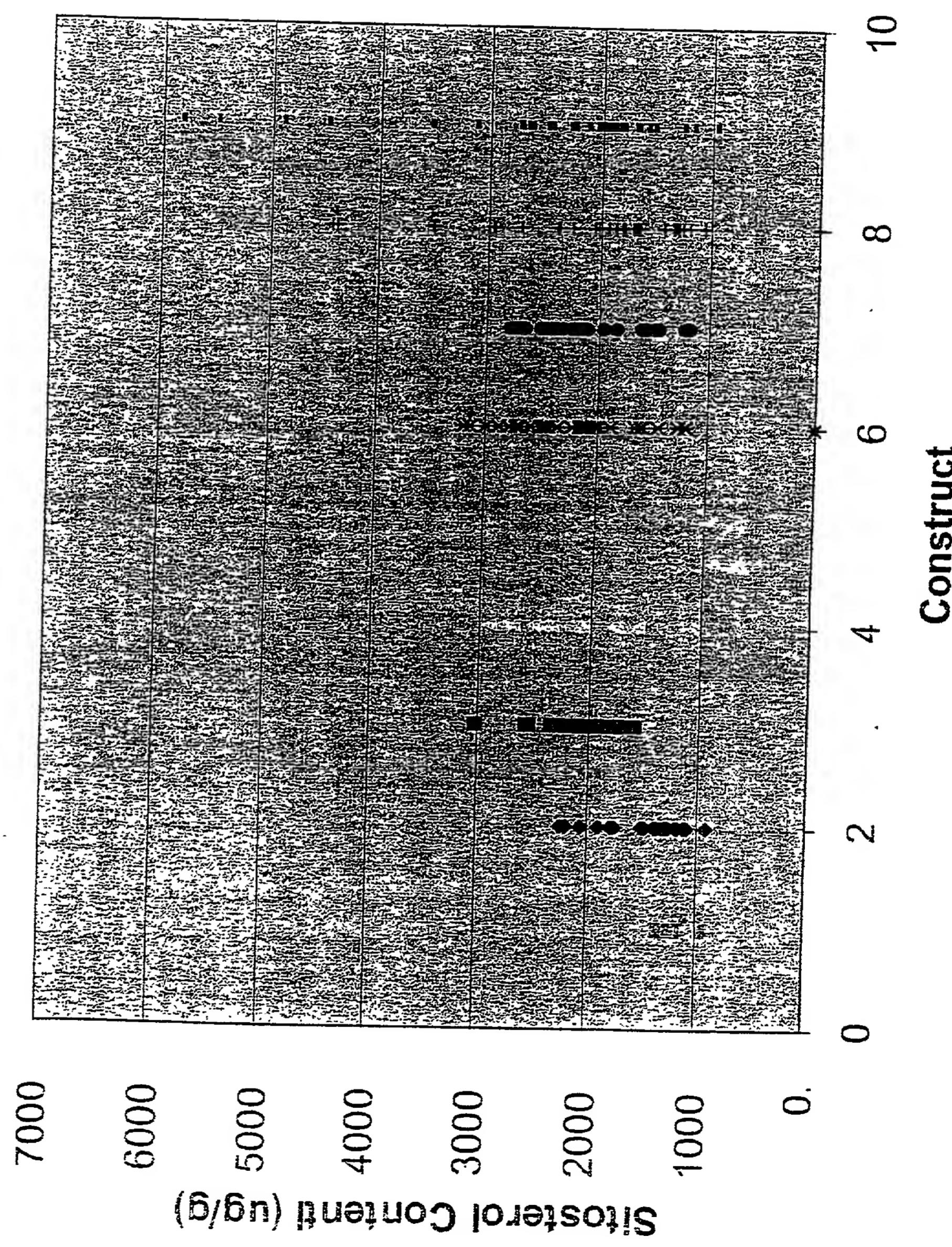


FIG. 26

Comparison of Sitostanol Levels in Transgenic Plants

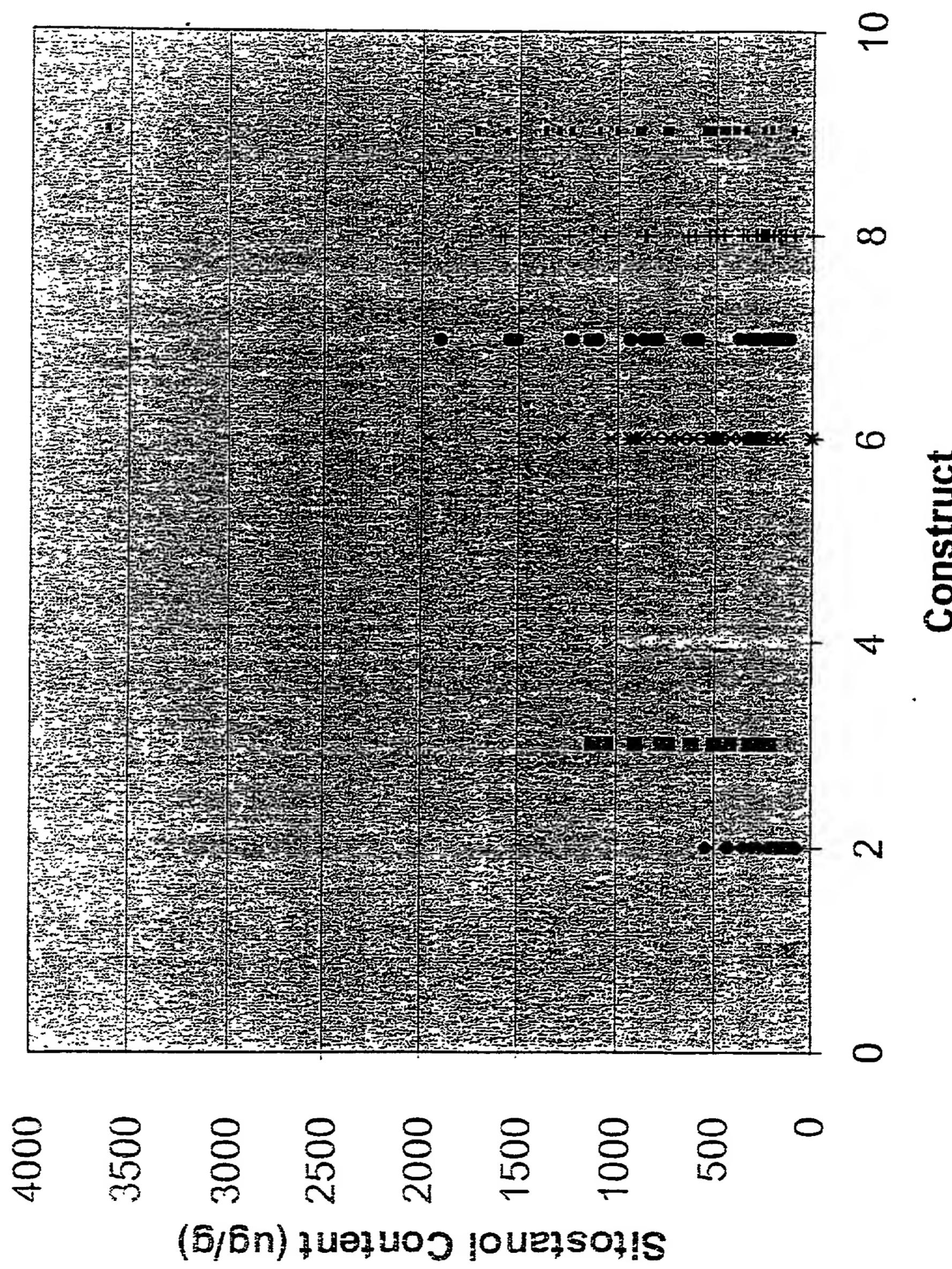


FIG. 27

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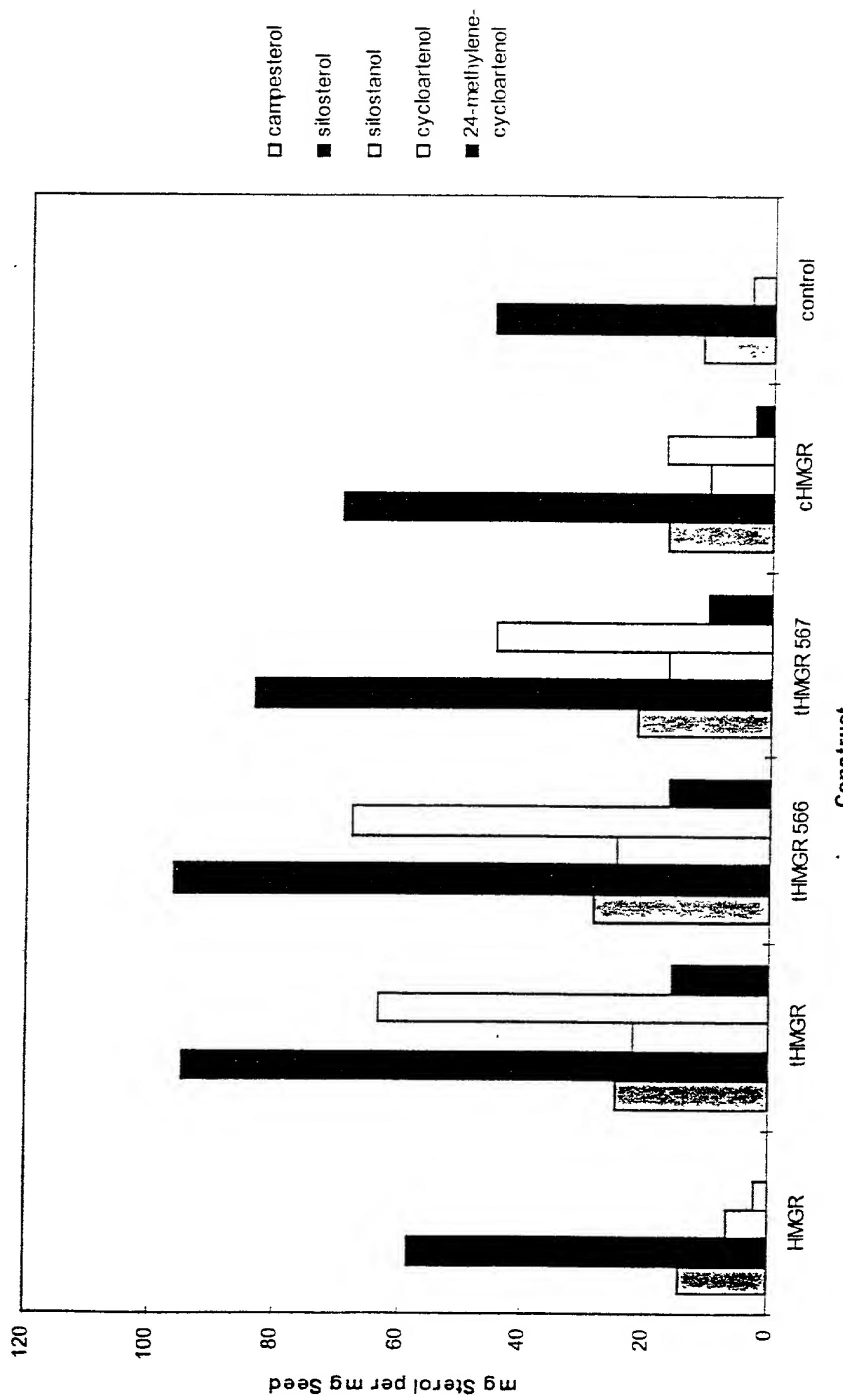
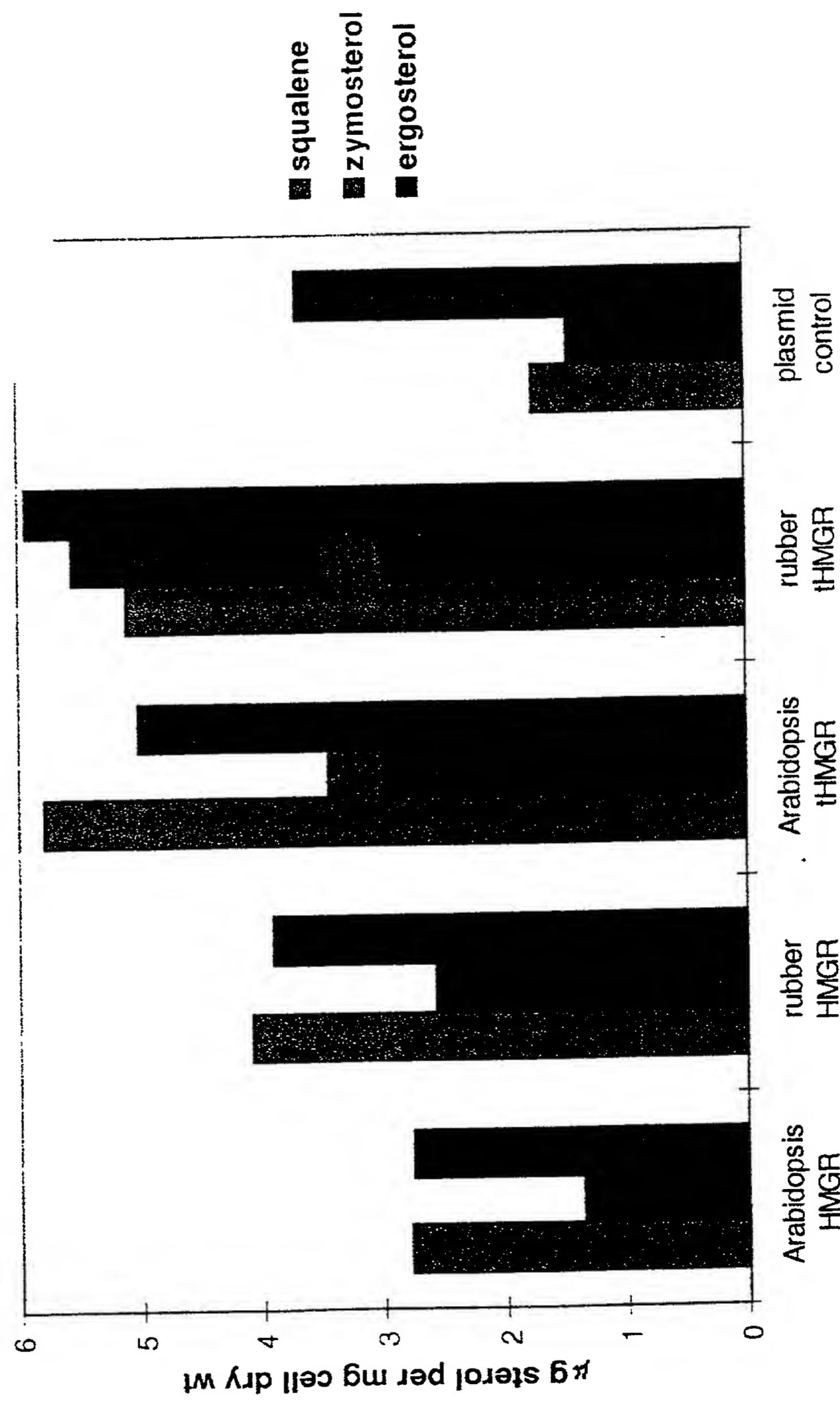


FIG. 28

Plant HMGCR Constructs in Yeast HMGCR1  
Knockout Mutant

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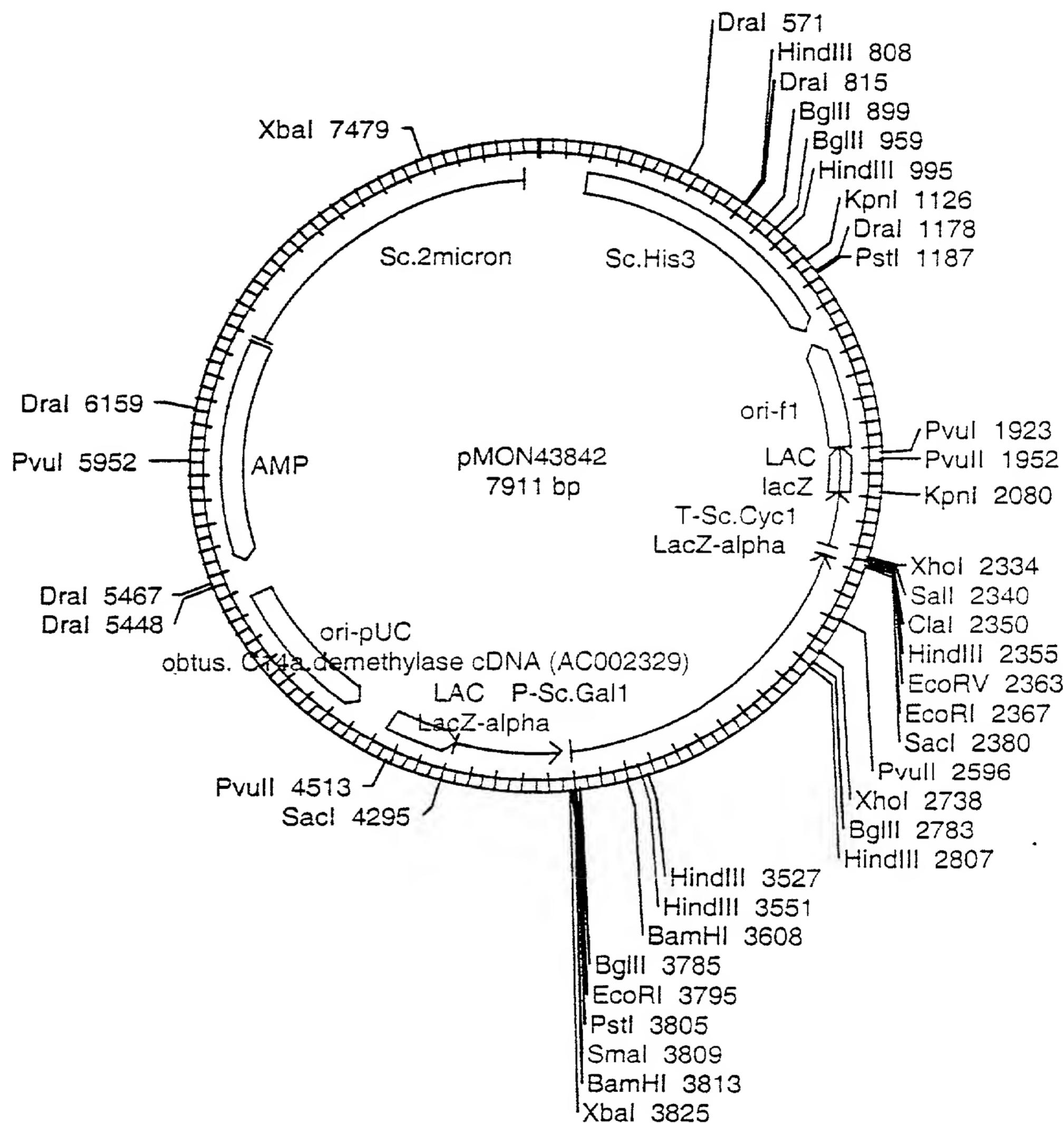


Figure 29: Construct pMON43842

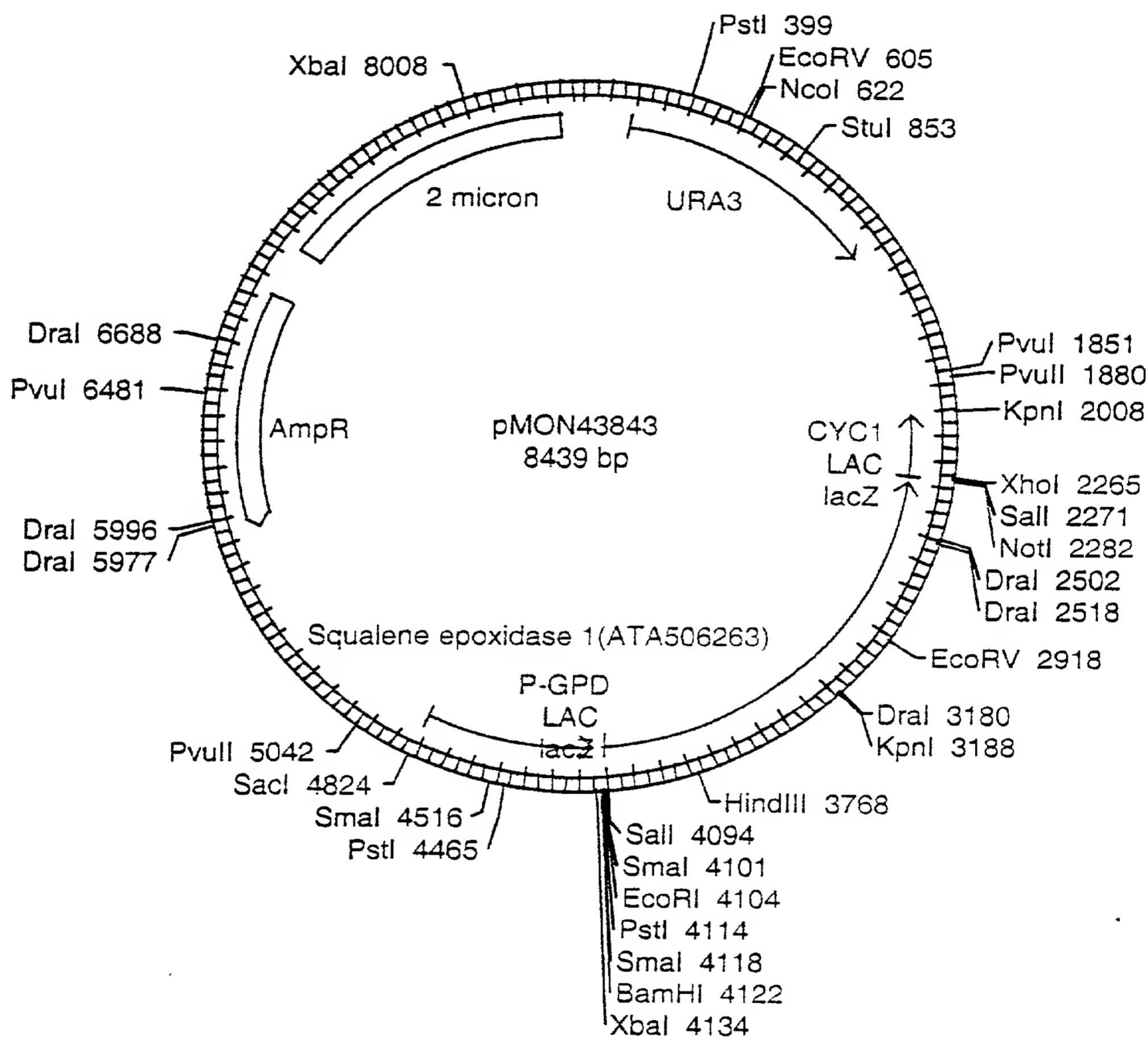


Figure 30: Construct pMON43843

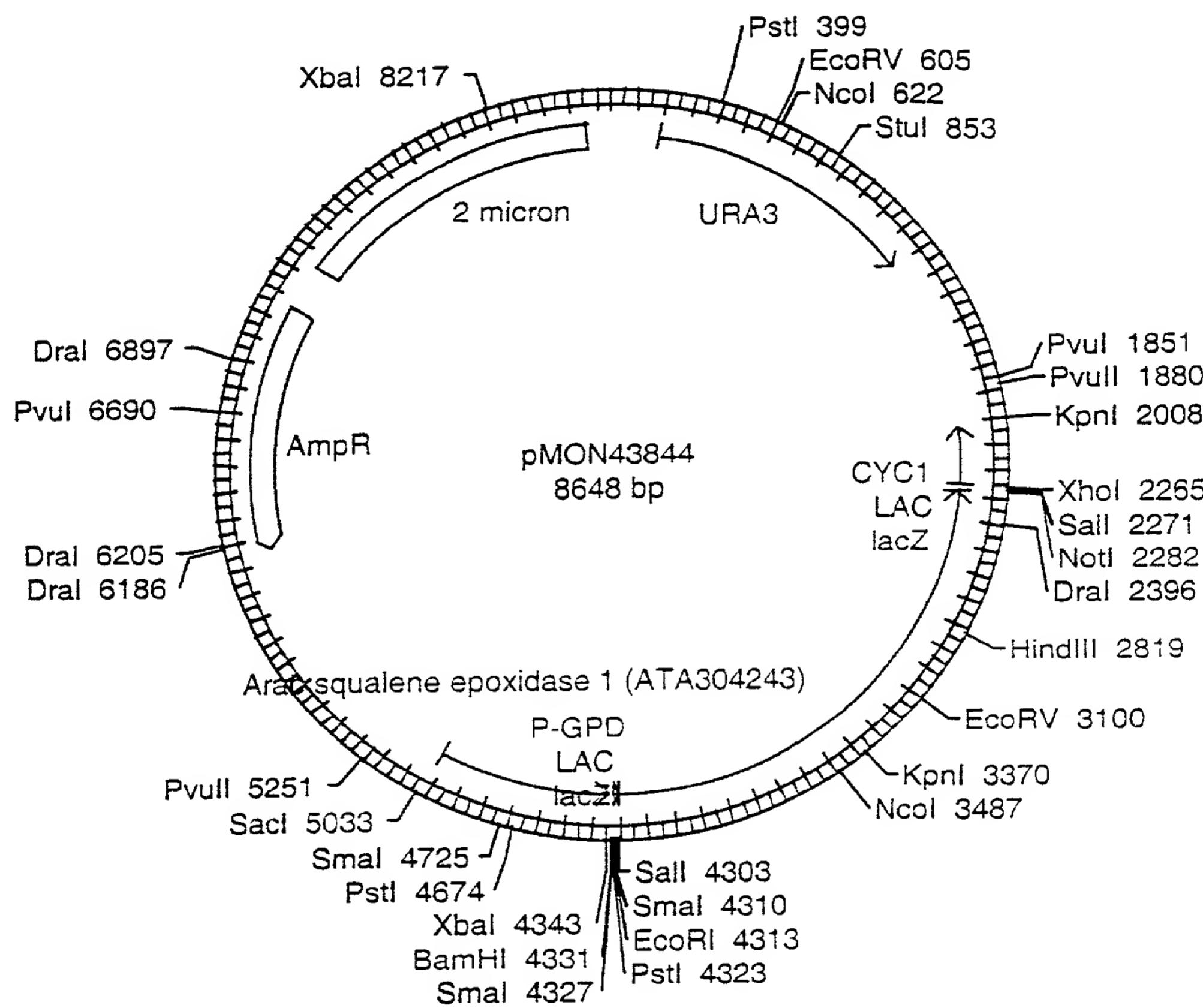


Figure 31: Construct pMON43844

## FIG. 32A

Plurality: 5.00 Threshold: 4 AveWeight 1.00 AveMatch 2.91 AvMisMatch -2.00

1

50

HMGRclustalW{methanobac}	.....
.....	.....
HMGRclustalW{methanococ}	.....
.....	.....
HMGRclustalW{halobacter}	.....
.....	.....
HMGRclustalW{sulfolobus}	.....
.....	.....
HMGRclustalW{yeast2}	MSLPLKTIVH LVKPFACRAR FSARYPIHVI VVAVLLSAAA
YLSVTQSYLN	
HMGRclustalW{yeast1}	MPPLFKGLKQ MAKPIAYVSR FSAKRPPIHII LFSLIISAF
YLSVIQYYFN	
HMGRclustalW{phycomyces}	.....
.....	.....
HMGRclustalW{fusarium}	.....
.....	.....
HMGRclustalW{candida}	.....
.....	.....
HMGRclustalW{dictyoste2}	.....
.....	.....
HMGRclustalW{wheat1}	.....
.....	.....
HMGRclustalW{rice}	.....
.....	.....
HMGRclustalW{corn}	.....
.....	.....
HMGRclustalW{wheat3}	.....
.....	.....
HMGRclustalW{wheat2}	.....
.....	.....
HMGRclustalW{soybean}	.....
.....	.....
HMGRclustalW{rubbertre3}	.....
.....	.....
HMGRclustalW{rosyperiwi}	.....
.....	.....
HMGRclustalW{tomato}	.....
.....	.....
HMGRclustalW{woodtobacc}	.....
.....	.....
HMGRclustalW{potato}	.....
.....	.....
HMGRclustalW{radish}	.....
.....	.....
HMGRclustalW{arabadopsis1}	.....
.....	.....
HMGRclustalW{cucumismel}	.....
.....	.....
HMGRclustalW{rubbertre2}	.....
.....	.....
HMGRclustalW{rubbertre1}	.....
.....	.....
HMGRclustalW{camptothec}	.....
.....	.....
HMGRclustalW{arabadops2}	.....
.....	.....
HMGRclustalW{chineseham}	.....
.....	.....

FIG. 32B

HMGRclustalW{chineseha2}	.....
HMGRclustalW{syrianhamst}	.....
HMGRclustalW{ rat}	.....
HMGRclustalW{ rabbit}	.....
HMGRclustalW{ human}	.....
HMGRclustalW{ mouse}	.....
HMGRclustalW{ xenopus}	.....
HMGRclustalW{ sea urchin}	.....
HMGRclustalW{ cockroach}	.....
HMGRclustalW{ drosophila}	.....
HMGRclustalW{dictyoste1}	.....
HMGRclustalW{schistosom}	.....
HMGRclustalW{archaeoglo}	.....
HMGRclustalW{pseudomonas}	.....
Consensus	-----
---	-----

FIG. 32C

51

100	HMGRclustalW{methanobac}	.....
.....	HMGRclustalW{methanococ}	.....
.....	HMGRclustalW{halobacter}	.....
.....	HMGRclustalW{sulfolobus}	.....
.....	HMGRclustalW{yeast2}	EWKLDQN.QY STYLSIKPDE LFEKCTHYR SPVSDTWKLL
SSKEAADIYT	HMGRclustalW{yeast1}	GWQLDNSNSVF ETAPNKSNT LFQECSHYYR DSSLGDGVSI
TAHEASELPA	HMGRclustalW{phycomyces}	.....
.....	HMGRclustalW{fusarium}	..... MDH EGCQGQHPQQ
CCQWVSNAWS	HMGRclustalW{candida}	..... MFYH GASANQHWIA
VDDLSKVPVD	HMGRclustalW{dictyoste2}	.....
.....	HMGRclustalW{wheat1}	.....
.....	HMGRclustalW{rice}	.....
.....	HMGRclustalW{corn}	.....
.....	HMGRclustalW{wheat3}	.....
.....	HMGRclustalW{wheat2}	.....
.....	HMGRclustalW{soybean}	.....
.....	HMGRclustalW{rubbertre3}	.....
.....	HMGRclustalW{rosyperiwi}	.....
.....	HMGRclustalW{tomato}	.....
.....	HMGRclustalW{woodtobacc}	.....
.....	HMGRclustalW{potato}	.....
.....	HMGRclustalW{radish}	.....
.....	HMGRclustalW{arabadopsis1}	.....
.....	HMGRclustalW{cucumismel}	.....
.....	HMGRclustalW{rubbertre2}	.....
.....	HMGRclustalW{rubbertre1}	.....
.....	HMGRclustalW{camptothec}	.....
.....	HMGRclustalW{arabadops2}	.....
.....	HMGRclustalW{chineseham}	..... MLSRLFRMH
GLFVASHPWE	HMGRclustalW{chineseha2}	..... MLSRLFRMH

FIG. 32D

FIG. 32E

101

150 HMGRclustalW{methanobac} .....  
 ..... HMGRclustalW{methanococ} .....  
 ..... HMGRclustalW{halobacter} .....  
 ..... HMGRclustalW{sulfolobus} .....  
 ..... HMGRclustalW{ yeast2} PFHYYLSTIS FQSKDNSTTL PSLDDVIYSV DHTRYLLSEE  
 PKIPTELVSE  
 ..... HMGRclustalW{ yeast1} PHHYYLLNLN FNSPNETDSI PELANTVFEK DNTKYILQED  
 LSVSKEISST  
 ..... HMGRclustalW{phycomyces} .....  
 ..... HMGRclustalW{ fusarium} EFLDLLKNAE TLDIVIMLLG YIAMHLTFSV LFLSMRKMG  
 KFWLGICTLF  
 ..... HMGRclustalW{ candida} VDHYNVVPFQ FRRAGEYKEP VLSGIVELDE VKFVVSQSDA  
 AEQWQQLTAE  
 ..... HMGRclustalW{dictyoste2} .....  
 ..... HMGRclustalW{wheat1} .....  
 ..... HMGRclustalW{ rice} .....  
 ..... HMGRclustalW{ corn} .....  
 ..... HMGRclustalW{wheat3} .....  
 ..... HMGRclustalW{wheat2} .....  
 ..... HMGRclustalW{ soybean} .....  
 ..... HMGRclustalW{rubbertre3} .....  
 ..... HMGRclustalW{rosyperiwi} .....  
 ..... HMGRclustalW{ tomato} .....  
 ..... HMGRclustalW{woodtobacc} .....  
 ..... HMGRclustalW{ potato} .....  
 ..... HMGRclustalW{ radish} .....  
 ..... HMGRclustalW{arabadopsis1} .....  
 ..... HMGRclustalW{cucumismel} .....  
 ..... HMGRclustalW{rubbertre2} .....  
 ..... HMGRclustalW{rubbertre1} .....  
 ..... HMGRclustalW{camptothec} .....  
 ..... HMGRclustalW{arabadops2} .....  
 ..... HMGRclustalW{chineseham} VIVGTVT..L TICMMSMN.. MFTGNNK..

FIG. 32F

```

HMGRclustalW{chineseha2} VIVGTVT..L TICMMMSMN.. MFTGNNK.... .
HMGRclustalW{syrianhamst} VIVGTVT..L TICMMMSMN.. MFTGNNK.... .
HMGRclustalW{ rat} VIVGTVT..L TICMMMSMN.. MFTGNNK.... .
HMGRclustalW{ rabbit} VIVGTVT..L TICMMMSMN.. MFTGNDK.... .
HMGRclustalW{ human} VIVGTVT..L TICMMMSMN.. MFTGNNK.... .
HMGRclustalW{ mouse} .... .
HMGRclustalW{ xenopus} VIVGTVT..L TICMMMSMN.. MFTGNDK.... .
HMGRclustalW{ sea urchin} VIVCTLT..L TICMLSMN.. YFTGLPR.... .
HMGRclustalW{ cockroach} VIVATLT..L TVCMLTVDQ. RPLGLP.... .
HMGRclustalW{ drosophila} VIVALLT..I TACMLNGGQE QYPGCEQRIG HSTASAAAAG
SGSGAGSGAS
HMGRclustalW{dictyostel} .... .
HMGRclustalW{schistosom} .... .
HMGRclustalW{archaeoglo} .... .
HMGRclustalW{pseudomonas} .... .

Consensus VIVGTVT--L TICMMMSMN-- MFTGNNK--- -----

```

## FIG. 32G

151

200	HMGRclustalW{methanobac}	.....
.....	HMGRclustalW{methanococ}	.....
.....	HMGRclustalW{halobacter}	.....
.....	HMGRclustalW{sulfolobus}	.....
.....	HMGRclustalW{yeast2}	NGTKWRLRNN SNFILD LHNI YRN MVKQFSN KTSEFDQFDL FIILAAYLTL
.....	HMGRclustalW{yeast1}	DG TKWRLRSD RKSLFDV KTL AYS LYDVFSE NVTQADPF DV LIMVTAYLMM
.....	HMGRclustalW{phycomyces}	.....
.....	HMGRclustalW{fusarium}	SSVFAFLFGL VVTTKLGVP I SVILLSEGLP FLVVTIGFEK NIVLTRAVMS
.....	HMGRclustalW{candida}	DGTWWR SRAY HGKLGKYS DM AVGAFNKVLN LVRGAETFDI ALVTCAYIAM
.....	HMGRclustalW{dictyoste2}	.....
.....	HMGRclustalW{wheat1}	.....
.....	HMGRclustalW{rice}	.....
.....	HMGRclustalW{corn}	.....
.....	HMGRclustalW{wheat3}	.....
.....	HMGRclustalW{wheat2}	.....
.....	HMGRclustalW{soybean}	.....
.....	HMGRclustalW{rubbertre3}	.....
.....	HMGRclustalW{rosyperiwi}	.....
.....	HMGRclustalW{tomato}	.....
.....	HMGRclustalW{woodtobacc}	.....
.....	HMGRclustalW{potato}	.....
.....	HMGRclustalW{radish}	.....
.....	HMGRclustalW{arabadopsis1}	.....
.....	HMGRclustalW{cucumismel}	.....
.....	HMGRclustalW{rubbertre2}	.....
.....	HMGRclustalW{rubbertre1}	.....
.....	HMGRclustalW{camptothec}	.....
.....	HMGRclustalW{arabadops2}	.....
.....	HMGRclustalW{chineseham}	..... I CGWNYEC.PK FEEDV LSSDI IILTITRCIA

FIG. 32H

HMGRclustalW{chineseha2}	.....	.....	I CGWNYEC.PK FEEDVLSSDI
IILTITRCIA			
HMGRclustalW{syrianhamst}	.....	.....	I CGWNYEC.PK FEEDVLSSDI
IILTITRCIA			
HMGRclustalW{ rat}	.....	.....	I CGWNYEC.PK FEEDVLSSDI
IILTITRCIA			
HMGRclustalW{ rabbit}	.....	.....	I CGWNYEC.PK FEEDVLSSDI
IILTITRCIA			
HMGRclustalW{ human}	.....	.....	I CGWNYEC.PK FEEDVLSSDI
IILTITRCIA			
HMGRclustalW{ mouse}	.....	.....	.....
.....			
HMGRclustalW{ xenopus}	.....	.....	I CGWNYAC.PK FEEDVLSSDI
IILTITRCIA			
HMGRclustalW{ sea urchin}	.....	.....	I CGWNYECAPQ VKESSLSSDV
LVMCIMRTLA			
HMGRclustalW{ cockroach}	.....	.....	PGWGHNC..I TLEEYNAADM
IVMTLIRCV			
HMGRclustalW{ drosophila}	GTIPPSSMGG	SATSSRHRPC	HGWSQSC.DG LEAEYNAADV
ILMTIVRCTA			
HMGRclustalW{ dictyoste1}	.....	.....	.....
.....			
HMGRclustalW{ schistosom}	.....	.....	M LKILNTVLLF FDCFSTGTFF
VLLIYLFTRL			
HMGRclustalW{ archaeoglo}	.....	.....	.....
.....			
HMGRclustalW{ pseudomonas}	.....	.....	.....
.....			
Consensus	-----	-----	I CGWNYEC-PK FEEDVLSSDI
IILTITRCIA			

## FIG. 32I

201

250	HMGRclustalW{methanobac}	.....
.....	HMGRclustalW{methanococ}	.....
.....	HMGRclustalW{halobacter}	.....
.....	HMGRclustalW{sulfolobus}	.....
.....	HMGRclustalW{yeast2}	FYTLCCLFND MRKIGSKFWL SFSALSNSAC ALYLSLYTTH
SLLKKPASLL	HMGRclustalW{yeast1}	FYTIFGLFND MRKTGSNFWL SASTVVNSAS SLFLALYVTQ
CILGKEVSAL	HMGRclustalW{phycomyces}	.....
.....	HMGRclustalW{fusarium}	HAIEHRRRIQA QNSKSGKRSP DGSTQNMIQY AVQAAIKEKG
FEIIRDYAI	HMGRclustalW{candida}	FYTLFNLFAR MRAVGSKVWL GLSTLVSSFF AFLFALYITT
RVLDLSIPFL	HMGRclustalW{dictyoste2}	.....
.....	HMGRclustalW{wheat1}	.....
.....	HMGRclustalW{rice}	.....
.....	HMGRclustalW{corn}	.....
.....	HMGRclustalW{wheat3}	.....
.....	HMGRclustalW{wheat2}	.....
.....	HMGRclustalW{soybean}	.....
.....	HMGRclustalW{rubbertre3}	.....
.....	HMGRclustalW{rosyperiwi}	.....
.....	HMGRclustalW{tomato}	.....
.....	HMGRclustalW{woodtobacc}	.....
.....	HMGRclustalW{potato}	.....
.....	HMGRclustalW{radish}	.....
.....	HMGRclustalW{arabadopsis1}	.....
.....	HMGRclustalW{cucumismel}	.....
.....	HMGRclustalW{rubbertre2}	.....
.....	HMGRclustalW{rubbertre1}	.....
.....	HMGRclustalW{camptothec}	.....
.....	HMGRclustalW{arabadops2}	.....
.....	HMGRclustalW{chineseham}	ILYIYFQFQN LRQLGSKYIL GIAGLFTIFS SFVFSTVVIH
.....		

FIG. 32J

HMGRclustalW{chineseha2}	ILYIYFQFQN LRQLGSKYIL GIAGLFTIFS SFVFSTVVIH
.....	.....
HMGRclustalW{syrianhamst}	ILYIYFQFQN LRQLGSKYIL GIAGLFTIFS SFVFSTVVIH
.....	.....
HMGRclustalW{ rat}	ILYIYFQFQN LRQLGSKYIL GIAGLFTIFS SFVFSTVVIH
.....	.....
HMGRclustalW{ rabbit}	ILYIYFQFQN LRQLGSKYIL GIAGLFTIFS SFVFSTVVIH
.....	.....
HMGRclustalW{ human}	ILYIYFQFQN LRQLGSKYIL GIAGLFTIFS SFVFSTVVIH
.....	.....
HMGRclustalW{ mouse}	.....
.....	.....
HMGRclustalW{ xenopus}	ILYIYFQFQN LRQLGSKYIL GIAGLFTIFS SFVFSTVVIH
.....	.....
HMGRclustalW{ sea urchin}	VAYLYLQFTK LRTTGSKYIL GIAGLFTIFS SFLFSSAVIH
.....	.....
HMGRclustalW{ cockroach}	VLYSYYQFCH LQKLGSKYIL GIAGLFTVFS SFVFSSSVIN
.....	.....
HMGRclustalW{ drosophila}	VLYCYYQFCS LHRLGSKYVL GIAGLFTVFS SFIFTTAAIK
.....	.....
HMGRclustalW{ dictyoste1}	.....
.....	.....
HMGRclustalW{ schistosom}	RTHLLHFSSS NCHLDVIIYQ SRAVIIFLVV FVYFIGVLTC
KINDKILVHT	
HMGRclustalW{ archaeoglo}	.....
.....	.....
HMGRclustalW{ pseudomonas}	.....
.....	.....
Consensus	ILYIYFQFQN LRQLGSKYIL GIAGLFTIFS SFVFSTVVIH -----
-----	-----

## FIG. 32K

251

300

HMGRclustalW{methanobac}	.....
HMGRclustalW{methanococ}	.....
HMGRclustalW{halobacter}	.....
HMGRclustalW{sulfolobus}	.....
HMGRclustalW{yeast2}	SLVIGLPFIV VIIG.FKHKV RLAAFSLQKF HRISIDKKIT VSNIIYEA MF
HMGRclustalW{yeast1}	TLFEGLPFIV VVVG.FKHKI KIAQYALEKF ERVGLSKRIT TDEIVFESVS
HMGRclustalW{phycomyces}	.....
HMGRclustalW{fusarium}	IVILVIGAAS GVQGGLQQFC FLAAWTLF.F DFILLFTFYT AILSIKLRST
HMGRclustalW{candida}	SLSEGIPFFV AVVG.FNNKI LLAEKVLQ.N QLNAQSSKND APTVLYQALR
HMGRclustalW{dictyoste2}	.....
HMGRclustalW{wheat1}	.....
HMGRclustalW{rice}	.....
HMGRclustalW{corn}	..... M EVRG..... GVGQGSAAR HPPA
HMGRclustalW{wheat3}	.....
HMGRclustalW{wheat2}	.....
HMGRclustalW{soybean}	.....
HMGRclustalW{rubbertre3}	..... M DEVRRRPP.K HIVRKDHGE VLNSFSHG..
HMGRclustalW{rosyperiwi}	..... M DSRRRSP... TVTAKAAAGE LPLAPHEGQ.
HMGRclustalW{tomato}	..... M DVRRRSEEPV YPSKVFAADE KPLKPHKKQQ
HMGRclustalW{woodtobacc}	..... M DVRRRSEKPA YPTKEFAAGE KPLKPHK...
HMGRclustalW{potato}	..... M DVRRRPVKPL YTSKDASAG. EPLKQQE...
HMGRclustalW{radish}	..... M DIRR..RPPK PPVNSN.... ...RFLDNRS
HMGRclustalW{arabadopsis1}	..... M DLRR..RPPK PPVTNNNNSN GSFRSYQPRT
HMGRclustalW{cucumismel}	..... M DRRRSLRPPR PNAVQDADAT CTFRRDEQDA
HMGRclustalW{rubbertre2}	.....
HMGRclustalW{rubbertre1}	..... M DTTG..RLH. ....HR.... ....KHAT
HMGRclustalW{camptothec}	..... M DVRRRSINSI HQIPSVGGTA PPMLKPKQPT
HMGRclustalW{arabadops2}	..... M EDLRRRFPTK KNGEEISN..
HMGRclustalW{chineseham}	FLDKELTGLN EALPFFLLI DLSRASALAK FALSSNSQDE VRENIARGMA

FIG. 32L

HMGRclustalW{chineseha2}	FLDKELTGLN EALPFFLLI DLSRASALAK FALSSNSQDE
VRENIARGMA	
HMGRclustalW{syrianhamst}	FLDKELTGLN EALPFFLLI DLSRASALAK FALSSNSQDE
VRENIARGMA	
HMGRclustalW{ rat}	FLDKELTGLN EALPFFLLI DLSRASALAK FALSSNSQDE
VRENIARGMA	
HMGRclustalW{ rabbit}	FLDKELTGLN EALPFFLLI DLSRASALAK FALSSNSQDE
VRENIARGMA	
HMGRclustalW{ human}	FLDKELTGLN EALPFFLLI DLSRASALAK FALSSNSQDE
VRENIARGMA	
HMGRclustalW{ mouse}	.....
.....	.....
HMGRclustalW{ xenopus}	FLDKELTGLN EALPFFLLI DLSKASALAK FALSSNSQDE
VRDNIARGMA	
HMGRclustalW{ sea urchin}	LFGLELTGLN EALPFFLLI DLTKASALTK FALSSTTQNE
VVDNIARGMA	
HMGRclustalW{ cockroach}	FLGSDVSDLK DALFFFLLI DLSKATVLAQ FALSSRSQDE
VKHNIARGIA	
HMGRclustalW{ drosophila}	FLGSDISELK DALFFLLVI DLSNSGRLRS GAMGSN.QAE
VTQNIARGLE	
HMGRclustalW{ dictyostel}	.....
.....	.....
HMGRclustalW{ schistosom}	MLRNKRQLNT LFYTLILFTF ALCSLSSVLF VPYTSFAIFL
LSTSVFLLFS	
HMGRclustalW{ archaeoglo}	.....
.....	.....
HMGRclustalW{ pseudomonas}	.....
.....	.....
Consensus	FLDKELTGLN EALPFFLL- DL-RASALAK FALSSNSQDE
VRENIARGMA	

## FIG. 32M

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350	HMGRclustalW{methanobac}	.....
.....	HMGRclustalW{methanococ}	.....
.....	HMGRclustalW{halobacter}	.....
.....	HMGRclustalW{sulfolobus}	.....
.....	HMGRclustalW{yeast2}	QEGAYLIRDY LFYISSFIGC AIYARHLPGL VNFCILSTFM
LVFDLLSAT	HMGRclustalW{yeast1}	EEGGRLIQDH LLCIFAFIGC SMYAHQLKTL TNFCILSAFI
LIFELILTPT	HMGRclustalW{phycomyces}	.....
.....	HMGRclustalW{fusarium}	VSSVMSICVW PLRMMASRRV AENVAKGDDE LNRVRGDAPL
FGRKSSSIPK	HMGRclustalW{candida}	EQGPLLLRDH LFMITAFLGC SFYASYLDGL KNFCILAALI
LAFDILTTST	HMGRclustalW{dictyoste2}	.....
.....	HMGRclustalW{wheat1}	.....
.....	HMGRclustalW{rice}	..... MRIT.....
...NGLAMVS	HMGRclustalW{corn}	PE....PSRA .....AA RVQAGDALPL PIRHT.....
...NLIFSAL	HMGRclustalW{wheat3}	.....
.....	HMGRclustalW{wheat2}	.....
.....	HMGRclustalW{soybean}	.....
.....	HMGRclustalW{rubbertre3}	.....HH L.....PP LKPSDYSPL PLYLA.....
...NALVFSL	HMGRclustalW{rosyperiwi}	.....NQ Q.....PS IPRSSDVPL PLYLA.....
...NGVFFTL	HMGRclustalW{tomato}	QQ....QEDK N.....TL LIDASDALPL PLYLTT....
...NGLFFTM	HMGRclustalW{woodtobacc}	QQ....QEQQ N.....SL LI.ASDALPL PLYLT.....
...NGLFFTM	HMGRclustalW{potato}	.....VS SPKASDALPL PLYLT....
...NGLFFTM	HMGRclustalW{radish}	DD....DDRR K.....TLTS PPKASDALPL PLYLT....
...NAVFFTL	HMGRclustalW{arabadopsis1}	SD....DDHR RR..ATTIAP PPKASDALPL PLYLT....
...NAVFFTL	HMGRclustalW{cucumismel}	SA....ADHL KR.....A SPKASDALPL PLYLT....
...NTIFFTL	HMGRclustalW{rubbertre2}	.....
.....	HMGRclustalW{rubbertre1}	PV....EDRS P.....T TPKASDALPL PLYLT....
...NAVFFTL	HMGRclustalW{camptothec}	KV....DAVD L.....PD SPKASDALPL PLYIT....
...NGVFFTL	HMGRclustalW{arabadops2}	.....VAVD .....PP LRKASDALPL PLYLT....
...NTFFLSL	HMGRclustalW{chineseham}	ILGPTFTLDA LV..ECLVIG VGTMSGVRQL EIMCCFGCMS
VLANYFVFMT		

FIG. 32N

HMGRclustalW{chineseha2}	ILGPTFTLDA LV..ECLVIG VGTMSGVRQL EIMCCFGCMS
VLANYFVFMT	
HMGRclustalW{syrianhamst}	ILGPTFTLDA LV..ECLVIG VGTMSGVRQL EIMCCFGCMS
VLANYFVFMT	
HMGRclustalW{ rat}	ILGPTFTLDA LV..ECLVIG VGTMSGVRQL EIMCCFGCMS
VLANYFVFMT	
HMGRclustalW{ rabbit}	ILGPTFTLDA LV..ECLVIG VGTMSGVRQL EIMCCFGCMS
VLANYFVFMT	
HMGRclustalW{ human}	ILGPTFTLDA LV..ECLVIG VGTMSGVRQL EIMCCFGCMS
VLANYFVFMT	
HMGRclustalW{ mouse}	.....
.....	.....
HMGRclustalW{ xenopus}	ILGPTFTLEA LV..ECLVIG VGTMSGVRQL EIMCCFGCMS
VLANYFAFMT	
HMGRclustalW{ sea urchin}	ILGPTITLDT VV..TTLVIS IGTMSSIRKM EVFCCFGILS
LIANYFVFMT	
HMGRclustalW{ cockroach}	MLGPTITLDT VV..ETLVIG VGMLSGVRRL EVLCCFACMS
VIVNYVVVFMT	
HMGRclustalW{ drosophila}	LLGPAISLDT IV..VVLLVG VGTLSGVQRL EVLCMFAVLS
VLVNYVVVFMT	
HMGRclustalW{ dictyostel}	..... M LFAPPNLETK ELFWIY. IL
ILIPKVFAKV	
HMGRclustalW{ schistosom}	DLSVFFIVLE YYLLEIELVN YEHAKRHCLL SHLFSNQLFV
DHMLGMFLKT	
HMGRclustalW{ archaeoglo}	.....
.....	.....
HMGRclustalW{ pseudomonas}	.....
.....	.....
Consensus	ILGPTFTLDA LV--ECLVIG VGTASD-LPL -LYCTFGCMS
VLANYFFFMT	

## FIG. 320

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400	HMGRclustalW{methanobac}	.....
.....	HMGRclustalW{methanococ}	.....
.....	HMGRclustalW{halobacter}	.....
.....	HMGRclustalW{sulfolobus}	.....
.....	HMGRclustalW{yeast2}	FYSAILSMKL EINIIHRSTV IRQTL..EED GVVPTTADII
YKDETASEPH	HMGRclustalW{yeast1}	FYSAILALRL EMNVIHRSTI IKQTL..EED GVVPTSTARII
SKAEKKSVSS	HMGRclustalW{phycomyces}	.....
.....	HMGRclustalW{fusarium}	FKVLMILGFI FVNIVNICS FPRNP..SSM STIRTWASSL
GGVIAPLSVD	HMGRclustalW{candida}	FLSAILSLKL EINQIHRSTL LREQL..EDD GLTETTVDDV
LKSNSLAGTK	HMGRclustalW{dictyoste2}	.....
.....	HMGRclustalW{wheat1}	.....
.....	HMGRclustalW{rice}	LVLSSCDLVR LCSDRER... PL..... GGREFA
TVVCQLASVV	HMGRclustalW{corn}	FAASLAYILMR RWREKIRSSST PLHA..... VGLAEML
AIFGLVVASLI	HMGRclustalW{wheat3}	.....
.....	HMGRclustalW{wheat2}	.....
.....	HMGRclustalW{soybean}	.....
.....	HMGRclustalW{rubbertre3}	FFSVAYFLLH RWREKIRKST PLHI..... VTFPEIA
ALICLVASVI	HMGRclustalW{rosyperiwi}	FFSVMYFLLT RWREKIRNAT PLHV..... VTLSELA
ALASLIASVI	HMGRclustalW{tomato}	FFSVMYFLLS RWREKIRNST PLHV..... VTLSELG
AIVSLIASVI	HMGRclustalW{woodtobacc}	FFSVMYYLLS RWREKIRNST PLHV..... VTFSELV
AIASLIASVI	HMGRclustalW{potato}	FFSVMYFLLV RWREKIRNSI PLHV..... VTLSELL
AMVSLIASVI	HMGRclustalW{radish}	FFSVAYYLLH RWRDKIRYNT PLHV..... VTVTELG
AIVALIASFI	HMGRclustalW{arabadopsis1}	FFSVAYYLLH RWRDKIRYNT PLHV..... VTITELG
AIIALIASFI	HMGRclustalW{cucumismel}	FFSVAYYLLH RWRDKIRNST PLHV..... VTLSEIA
AIVSLMASFI	HMGRclustalW{rubbertre2}	.....
.....	HMGRclustalW{rubbertre1}	FFSVAYYLLH RWRDKIRNST PLHI..... VTLSEIV
AIVSLIASFI	HMGRclustalW{camptothec}	FFTVVYYLLV RWREKIRNST PLHV..... VTLSEIA
AIFTFVASFI	HMGRclustalW{arabadops2}	FFATVYFLLS RWREKIRNST PLHV..... VDLSEIC
ALIGFVASFI	HMGRclustalW{chineseham}	FFPACVSLVL ELSRESREGR PIWQ...LSH FARVLEEE.
NKPNPVTQRV		

## FIG. 32P

HMGRclustalW{chineseha2}	FFPACVSLVL ELSRESREGR PIWQ...LSH FARVLEEEE.
NKPNPVTQRV	
HMGRclustalW{syrianhamst}	FFPACVSLVL ELSRESREGR PIWQ...LSH FARVLEEEE.
NKPNPVTQRV	
HMGRclustalW{ rat}	FFPACVSLVL ELSRESREGR PIWQ...LSH FARVLEEEE.
NKPNPVTQRV	
HMGRclustalW{ rabbit}	FFPACVSLVL ELSRESREGR PIWQ...LSH FARVLEEEE.
NKPNPVTQRV	
HMGRclustalW{ human}	FFPACVSLVL ELSRESREGR PIWQ...LSH FARVLEEEE.
NKPNPVTQRV	
HMGRclustalW{ mouse}	.....
.....	
HMGRclustalW{ xenopus}	FFPACVSLVL ELSRESREGR PIWQ...LSQ FASVLEEEEED
NKPNPVTQRV	
HMGRclustalW{ sea urchin}	FFPACLSLVL ELSNSNKYGR PVWH...LGR FAEVLEEEEED
RKPNPQVQRV	
HMGRclustalW{ cockroach}	FYPACLSLIL ELSRSGESGR PAWHD..KSL IIKALHEED.
QKPNPQVQRV	
HMGRclustalW{ drosophila}	FYPACLSLIF DLSRSGVDMMS VVREKAKGSL PLKSLTEEE.
QKANPVLQRV	
HMGRclustalW{ dictyoste1}	MSVRELFPFF KWGFNIRRSN FLVP..... ILSNNVI
VTGEEAVQYE	
HMGRclustalW{ schistosom}	SLFSISTTSK YAYLESIFKC TLMEQIIYIM IVFVFLPSFM
RIFASYAKRM	
HMGRclustalW{ archaeoglo}	.....
.....	
HMGRclustalW{ pseudomonas}	.....
.....	
Consensus	FFSACYSLLL -WRRKIRNST PLHV---LSH FARVTLEEEA AKPN-
VASRI	

## FIG. 32Q

401

450

HMGRclustalW{methanobac}	.....
HMGRclustalW{methanococ}	.....
HMGRclustalW{halobacter}	.....
HMGRclustalW{sulfolobus}	.....
HMGRclustalW{yeast2}	FLRSNVAILL GKASVIGLLL LINLYVF... .TDKLNATIL
NTVYFDSTIY	
HMGRclustalW{yeast1}	FLNLSVVVII MKLSVILLFV FINFYNF... GANWVN.DAF
NSLYFDKERV	
HMGRclustalW{phycomyces}	.....
HMGRclustalW{fusarium}	PKVVASNGLD AILPTAKSNN RPTLVT... LTPIKYELEY
PSIHYALGSA	
HMGRclustalW{candida}	TFTDAPSTLV TVAKVAGVSV FFGLHFY... GFGSAWLSDL
SAGNETNDTF	
HMGRclustalW{dictyoste2}	.....
HMGRclustalW{wheat1}	.....
HMGRclustalW{rice}	YLLSLFAHPD APATTTGDDD
HMGRclustalW{corn}	YLLSFFGIAF VQSIIVSSGDD
HMGRclustalW{wheat3}	.....
HMGRclustalW{wheat2}	.....
HMGRclustalW{soybean}	.....
HMGRclustalW{rubbertre3}	YLLGFFGIGF VHSFS.RAST
HMGRclustalW{rosyperiwi}	YLVSFFGLDF VQSLIYKPNN
HMGRclustalW{tomato}	YLLGFFGIGF VQTFVSRGNN
HMGRclustalW{woodtobacc}	YLLGFFGIGF VQSFVSRDNN
HMGRclustalW{potato}	YLLGFFGIGF VQSFVSRNS
HMGRclustalW{radish}	YLLGFFGIDF VQSFISRP..
HMGRclustalW{arabadopsis1}	YLLGFFGIDF VQSFISRASG
HMGRclustalW{cucumismel}	YLLGFFGIDF VQSFIARSSP
HMGRclustalW{rubbertre2}	.....
HMGRclustalW{rubbertre1}	YLLGFFGIDF VQSFIARASH
HMGRclustalW{camptothec}	YLLGFFGIGL VQPFTSRSSH
HMGRclustalW{arabadops2}	YLLGFCGIDL IFRSS..SD.
HMGRclustalW{chineseham}	KMIMSLGLVL VHAHSRWIAD PSPQNST... TE.HSKVSLG
LDEDVSKRIE	

FIG. 32R

```

HMGRclustalW{chineseha2} KMIMSLGLVL VHAHSRWIAD PSPQNST... TE.HSKVSLG
LDEDVSKRIE
HMGRclustalW{syrianhamst} KMIMSLGLVL VHAHSRWIAD PSPQNST... TE.HSKVSLG
LDEDVSKRIE
HMGRclustalW{ rat} KMIMSLGLVL VHAHSRWIAD PSPQNST... AE.QSKVSLG
LAEDVSKRIE
HMGRclustalW{ rabbit} KMIMSLGLVL VHAHSRWIAD PSPQNST... AD.NSKVSLG
LDENVSKRIE
HMGRclustalW{ human} KMIMSLGLVL VHAHSRWIAD PSPQNST... AD.TSKVSLG
LDENVSKRIE
HMGRclustalW{ mouse} ..... .....
.....
HMGRclustalW{ xenopus} KMIMSLGLVL VHAHSRWISE PSSQNST... SISDHEVTTM
LDDMMPKRVE
HMGRclustalW{ sea urchin} KMIMRTGLVL VHAHSYWLAS ....NDT... ELMSRDMLYD
GNLLTDKKID
HMGRclustalW{ cockroach} KVIMSAGLML VHAH.RWVRC .....L.
.....
HMGRclustalW{ drosophila} KLIMTTGLMA VHIYSREVSP ....AAT... TMVDKTLTPT
LSLNVSNNRT
HMGRclustalW{ dictyostel} KPLPYIPQHN QQQQQKQQPS ..... .
.....
HMGRclustalW{ schistosom} YGEQKKCLVS NKGVSSSTRK RRHSYSSGHS YVEYRRMSVH
NLIGYVVNPN
HMGRclustalW{ archaeoglo} ..... .
.....
HMGRclustalW{ pseudomonas} ..... .
.....

```

## FIG. 32S

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500	HMGRclustalW{methanobac}	.....
.....	HMGRclustalW{methanococ}	.....
.....	HMGRclustalW{halobacter}	.....
.....	HMGRclustalW{sulfolobus}	.....
.....	HMGRclustalW{yeast2}	SLPNFINYKD IGNLSNQVII SVLPKQYYTP LKKYHQIEDS
VLLIIDSVSN	HMGRclustalW{yeast1}	SLPDFITSNA SENFKEQAIV SVTPLLYYKP IKSYQRIEDM
VLLLLRNVS	HMGRclustalW{phycomyces}	.....
.....	HMGRclustalW{fusarium}	ASNPAYN.DA FHHHFQGYGV GGRMVGGILK SLEDPVLSKW
IVIALALSA	HMGRclustalW{candida}	TLYDAVA.DQ IPIGSNGTLV TLFPTRFFLP EKLSTQIEAV
VLSFIGLIST	HMGRclustalW{dictyoste2}	.....
.....	HMGRclustalW{wheat1}	.....
.....	HMGRclustalW{rice}	..D.....
.....	HMGRclustalW{corn}	..DEDFLVGS G.....
.....	HMGRclustalW{wheat3}	.....
.....	HMGRclustalW{wheat2}	.....
.....	HMGRclustalW{soybean}	.....
.....	HMGRclustalW{rubbertre3}	..D.SWDVEE Y..... D DDNIIIKEDT
R.....	HMGRclustalW{rosyperiwi}	..E.GWEIEE ..... EILMVEDS
RN.....	HMGRclustalW{tomato}	..D.SWDE.. ..... N DEEFLLKEDS
RC.....	HMGRclustalW{woodtobacc}	..DECWDEED E..... N DEQFLLEEDS
RR.....	HMGRclustalW{potato}	..D.SWDIED E..... N AEQLIIEEDS
RR.....	HMGRclustalW{radish}	..D.SGDSER ..... DFDDH
R.....	HMGRclustalW{arabadopsis1}	..D.AWDLAD T..... I ..... DDDDH
R.....	HMGRclustalW{cucumismel}	..D.AWDLED ..... EIDRT
L.....	HMGRclustalW{rubbertre2}	.....
.....	HMGRclustalW{rubbertre1}	..D.VWDLED T..... D P.NYLIDEDH
R.....	HMGRclustalW{camptothec}	..DDVVGVD DE..... D VDEIVLKEDT
R.....	HMGRclustalW{arabadops2}	..DDVWWNDG .....
.....	HMGRclustalW{chineseham}	PSVSLWQFYI SKMISMDIEQ VVTLSLAFLL AVKYIFFEQA
ET..ESTSL		

FIG. 32T

## FIG. 32U

501

550

HMGRclustalW{methanobac}	.....
HMGRclustalW{methanococ}	.....
HMGRclustalW{halobacter}	.....
HMGRclustalW{sulfolobus}	.....
HMGRclustalW{yeast2}	AIRDQFISKL LFFFAAVSIS INVYLLNAAK IHTGYMNFO.
..PQSNKIDD	
HMGRclustalW{yeast1}	AIRDRFVSKL VLSALVCSAV INVYLLNAAR IHTSYTADQL
VKTEVTKKSF	
HMGRclustalW{phycomyces}	.....
HMGRclustalW{fusarium}	LNGYLFNVAR WGIKDPNVPE HNIDRNELAR AREFNDTGS.
..AT	
HMGRclustalW{candida}	AARDKYISKF ILFAFAVSAS INVYLLNVAR IHTTRLEDA.
..IE	
HMGRclustalW{dictyoste2}	.....
HMGRclustalW{wheat1}	.....
HMGRclustalW{rice}	.....
HMGRclustalW{corn}	.....
HMGRclustalW{wheat3}	.....
HMGRclustalW{wheat2}	.....
HMGRclustalW{soybean}	.....
HMGRclustalW{rubbertre3}	.....
HMGRclustalW{rosyperiwi}	..... G ..
HMGRclustalW{tomato}	..... G ..
HMGRclustalW{woodtobacc}	..... G ..
HMGRclustalW{potato}	..... G ..
HMGRclustalW{radish}	.....
HMGRclustalW{arabadopsis1}	.....
HMGRclustalW{cucumismel}	.....
HMGRclustalW{rubbertre2}	.....
HMGRclustalW{rubbertre1}	.....
HMGRclustalW{camptothec}	.....
HMGRclustalW{arabadops2}	.....
HMGRclustalW{chineseham}	KN..PITSPV VTPKKAPDNC CRREPLLVRR SEKLSSVEEE
	PGVSQDRKVE

FIG. 32V

HMGRclustalW{chineseha2}	KN..PITSPV VTPKKAPDNC CRREPLLVRR SEKLSSVEEE
PGVSQDRKVE	
HMGRclustalW{syrianhamst}	KN..PITSPV ATPKKAPDNC CRREPVLSSRR NEKLSSVEEE
PGVNQDRKVE	
HMGRclustalW{ rat}	KN..PITSPV VTPKKAQDNC CRREPLLVRR NQKLSSVEED
PGVNQDRKVE	
HMGRclustalW{ rabbit}	KN..PITSPV VTQKKVPDSC CRREPVVVRN NQKFCSVEEE
AGMSQDRKVE	
HMGRclustalW{ human}	KN..PITSPV VTQKKVPDNC CRREPMLVRN NQKCDSVEEE
TGINRERKVE	
HMGRclustalW{ mouse}	.....
.....	
HMGRclustalW{ xenopus}	KN..PIISPV AVQKKQIESC CRREPEQ.EK TVHVSTTEEA
S..SKEETEA	
HMGRclustalW{ sea urchin}	MEGHEVVNPNG SDHEDASEVE TIGTLSSSPS TSDVRVIESM
TSRTQACQTD	
HMGRclustalW{ cockroach}	VTGDSVVNSN STDDAQLHYY IMRWLT..S ADHIVILILL
LALAVKFVFF	
HMGRclustalW{ drosophila}	RQ....SGPV AIEAKASQTT PIDEHV.. .... QEKD
TENSAAVRTL	
HMGRclustalW{ dictyostel}	.....
.....	
HMGRclustalW{ schistosom}	YEVTSIFHFI YNIFHVINAN LVVYFLGLF LFKRIRLNKP
INSQLRNLI	
HMGRclustalW{ archaeoglo}	.....
.....	
HMGRclustalW{ pseudomonas}	.....
.....	
Consensus	KN--PITSPV VT-KKAPDNC CRREPLLVRR --K-SSVEEE. -G-
SQDRKVE	

FIG. 32W

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600 HMGRclustalW{methanobac} .....  
 ..... HMGRclustalW{methanococ} .....  
 ..... HMGRclustalW{halobacter} .....  
 ..... HMGRclustalW{sulfolobus} .....  
 ..... HMGRclustalW{ yeast2} LVVQQKSATI EFSET ..... RSMPA SSGLETPVTA  
 KDIIISSEEIQ  
 HMGRclustalW{ yeast1} TAPVQKASTP VLTN ..... KTVIS GSKVKSLS  
 QSSSSGPSSS  
 HMGRclustalW{phycomyces} .....  
 ..... HMGRclustalW{ fusarium} LPLGEYVPPT PMRTQ ..... PSTPA ITDDEAEG..  
 ..LHMTKARP  
 HMGRclustalW{ candida} LKKPKKKASK TAVSV ..... PKAVV VKDSETTKSS  
 EILHSSSESE  
 HMGRclustalW{dictyoste2} ..KGKSVNVE DLKDQ ..... EIIAL VDKGEIOP..  
 ...HNLETRL  
 HMGRclustalW{wheat1} .....  
 ..... HMGRclustalW{ rice} ..... GQG GSR ..... RA....A  
 PPEPAPMHGH  
 HMGRclustalW{ corn} ..... SSGS AAA ..... PSRQHAQA  
 PAPCELLGSP  
 HMGRclustalW{wheat3} .....  
 ..... HMGRclustalW{wheat2} .....  
 ..... HMGRclustalW{ soybean} .....  
 ..... HMGRclustalW{rubbertre3} ..... PTG AC ..... AAPSLDCS  
 LSLPTKIHAP  
 HMGRclustalW{rosyperiwi} ..T..NCTTL GC ..... AVPPPSVP  
 KIAPVVPQQP  
 HMGRclustalW{ tomato} ..P...ATTL GC ..... AVPAPPAR  
 QIAPMAPPQP  
 HMGRclustalW{woodtobacc} ..P...ATTL GCT ..... AVPPPPAL  
 QIVPMVPPQP  
 HMGRclustalW{ potato} ..PCAAATTL GC ..... VVPPPPVR  
 KIAPMVPQQP  
 HMGRclustalW{ radish} ..... LVTC PPP ..... PPP....S  
 QIVAAKLPNP  
 HMGRclustalW{arabadopsis1} ..... LVTC SPP ..... TP....  
 IVSVAKLPNP  
 HMGRclustalW{cucumismel} ..... LIDN NRY ..... AAPRSASA  
 VALPSKVVDA  
 HMGRclustalW{rubbertre2} .....  
 ..... HMGRclustalW{rubbertre1} ..... LVTC PPA ..... NISTKTTI  
 IAAPTKLPTS  
 HMGRclustalW{camptothec} ..... TVP CAA ..... APVDCPLP  
 PIKPKVVDPV  
 HMGRclustalW{arabadops2} ..... MIPC NQ ..... SLDCREVL  
 PIKPNSVDPP  
 HMGRclustalW{chineseham} ..... VIKPLVVETE SAS ..... RATFVLG.A .SGTSPPVAA  
 RTQELEELP

## FIG. 32X

HMGRclustalW{chineseha2}	VIKPLVVETE SAS.....	.RATFVLG.A .SGTSPPVAA
RTQELEIELP		
HMGRclustalW{syrianhamst}	VIKPLVAETE STS.....	.RATFVLG.A .SGGCSPVAL
GTQEPEIELP		
HMGRclustalW{ rat}	VIKPLVAEAE TSG.....	.RATFVLG.A .SAASPPLAL
GAQEPEGIELP		
HMGRclustalW{ rabbit}	VIKPLVAETD SPH.....	.RAAFVVGGG .SF PDTSLVL
ETKEPEIELP		
HMGRclustalW{ human}	VIKPLVAETD TPN.....	.RATFVVGNS .SLLDTSSVL
VTQEPEIELP		
HMGRclustalW{ mouse}	.....	.....
.....		
HMGRclustalW{ xenopus}	VIKPLPLETS P.....	.KAKFIVG.. .DSSPLELSP
EDKNTMFDLP		
HMGRclustalW{ sea urchin}	PVTASPRNSR SSSPVSSHGV KPARFTIGSS GSGSEDEEEE	
VIKEEEVEWV		
HMGRclustalW{ cockroach}	ETRDELTTTR GMDG.....W VEVSSPVEHK YVQTEQPSCS	
APEQPLEEPP		
HMGRclustalW{ drosophila}	LFTIEDQSSA N.....	ASTQTDLL
PLRHRLVGPI		
HMGRclustalW{ dictyostel}	.....SGKEQ EQ.....	QQQQQQQQQQ
QQTPDITNQP		
HMGRclustalW{ schistosom}	PKIKETLISD QVKQSPVLPK FSKKLNDIPL QSRKRIYCLH	
KDDDYIDRND		
HMGRclustalW{ archaeoglo}	.....	.....
.....		
HMGRclustalW{ pseudomonas}	.....	.....
.....		
Consensus	VIKPLVAETE --S-----	-RATFV-G-A -SA-PPPPA- -I-
PPEIELP		

FIG. 32Y

601

650 HMGRclustalW{methanobac} ..... MS.  
 ...IMDDLME  
 HMGRclustalW{methanococ} ..... MEN  
 YNDILEKMLN  
 HMGRclustalW{halobacter} ..... MTD  
 AASLADRVRE  
 HMGRclustalW{sulfolobus} ..... MK.  
 IDEVVEKLVK  
 HMGRclustalW{yeast2} NNE.CVYALS SQDEPIRP.L SNLVELME... KEQLKNMN  
 NTEVSNLVVN  
 HMGRclustalW{yeast1} SEEDDSRDIE SLDKKIRP.L EEELEALLS... SGNTKQLK  
 NKEVAALVIH  
 HMGRclustalW{phycomyces} .....  
 .....  
 HMGRclustalW{fusarium} ANL..... PNRS.N EEELEKLLS... ENALREMT  
 DEEVISLSMR  
 HMGRclustalW{candida} SEQ..... SSRP.L EQVIELYK... DGKVKTIV  
 DDEVVSLVTA  
 HMGRclustalW{dictyoste2} PNN..... F QRAVHIRR... KLLARDLQ  
 KEHQRALHAQ  
 HMGRclustalW{wheat1} .....  
 .....  
 HMGRclustalW{rice} G..... GGMMEGD  
 DEEIVAAVAS  
 HMGRclustalW{corn} AA..... A... PEKMPED  
 DEEIVASVVA  
 HMGRclustalW{wheat3} .....  
 .....  
 HMGRclustalW{wheat2} .....  
 .....  
 HMGRclustalW{soybean} .....  
 .....  
 HMGRclustalW{rubbertre3} ..... I VSTTT.... TSTLSDD  
 DEQIIKSVVS  
 HMGRclustalW{rosyperiwi} SK..... MV.I IEKPAPLI... TPQNSEE  
 DEDIIKAVVA  
 HMGRclustalW{tomato} S..... MS.M VEKPAPLI... TSASSGE  
 DEEIIKSVVQ  
 HMGRclustalW{woodtobacc} SKV..... AA.M SEKPAPLV... TPAASEE  
 DEEIIKSVVQ  
 HMGRclustalW{potato} AKV..... ALS.Q TEKPSPPI... MPALSED  
 DEEIIQSVVQ  
 HMGRclustalW{radish} E..... QPPLPKE  
 DEEIVKSVD  
 HMGRclustalW{arabadopsis1} EP..... IV... TESLPEE  
 DEEIVKSVID  
 HMGRclustalW{cucumismel} EA..... LN... TIPLPEE  
 DEEVVKMVVD  
 HMGRclustalW{rubbertre2} .....  
 .....  
 HMGRclustalW{rubbertre1} EP..... LI... APLVSEE  
 DEMIVNSVVD  
 HMGRclustalW{camptothec} P..... I... SPPSSEE  
 DEEIIKSVVE  
 HMGRclustalW{arabadops2} RE..... SELDSVE  
 DEEIVKLVID  
 HMGRclustalW{chineseham} SE..... PRP.N EECLQILE.. SAEKGAKFLS  
 DAEIIQLVNA

FIG. 32Z

HMGRclustalW{chineseha2}	SE.....	PRP.N EECLQILE..	SAEKGAKFLS
DAEIIQLVNA			
HMGRclustalW{syrianhamst}	SE.....	PRP.N EECLQILE..	SAEKGAKFLS
DAEIIQLVNA			
HMGRclustalW{ rat}	SE.....	PRP.N EECLQILE..	SAEKGAKFLS
DAEIIQLVNA			
HMGRclustalW{ rabbit}	KE.....	PRP.N EECLQILG..	NAEKGAKFLS
DAEIIQLVNA			
HMGRclustalW{ human}	RE.....	PRP.N EECLQILG..	NAEKGAKFLS
DAEIIQLVNA			
HMGRclustalW{ mouse}	.....	.....	.....
.....			
HMGRclustalW{ xenopus}	EE.....	PRP.L DECVRILK..	NPDKGAAQYLT
DAEVISLVNA			
HMGRclustalW{ sea urchin}	LET.....	ELKAPRP.M PELLEIL...	NVGKGPNALT
DDEVQLLVGA			
HMGRclustalW{ cockroach}	AS.....	NRS.I DECLSVC...	KSDVGAQALS
DCEVMALVTS			
HMGRclustalW{ drosophila}	KP.....	PRP.V QECLDILNST	EEGSGPAALS
DEEIVSIVHA			
HMGRclustalW{ dictyostel}	TKTN.....	.....	KKIPIKELS
NEEILIKLEK			
HMGRclustalW{ schistosom}	SSSVSTFSNT	CKNSNERPSN	VLDLDMLTEK IKQGLGHELS
DTEILQLLSH			
HMGRclustalW{ archaeoglo}	.....	.....	.....
.MQVLRLDRR			
HMGRclustalW{ pseudomonas}	.....	.....	.....
.....			
Consensus	SE-----	PRP-N EECLQIL---	-AEKGAKSLS
DEEIIKLVVA			

FIG. 32AA

651

700	HMGRclustalW{methanobac}	GR..IKLYEI E.RHVPVDEA VRIRREFIE. ....RTCGVK
..LEHVSNYS	HMGRclustalW{methanococ}	GE..IKPYQL D.KMFGSKIA TEIRRKFIE. ....KKVGIE
..FKHICNYS	HMGRclustalW{halobacter}	GD..LRLHEL E.AHADADTA AEARRLLVE. ....SQSGAS
..LDAVGNYG	HMGRclustalW{sulfolobus}	GE..ISFHEV D.NLLEANAA MVARRLALE. ....KIVGVG
..LPSIGSTV	HMGRclustalW{ yeast2}	G..KLPLYSL EKKLEDTTRA VLVRKALST LAESPILVS.
..EKLPFRN	HMGRclustalW{ yeast1}	G..KLPLYAL EKKLGDTTRA VAVRRKALSI LAEAPVLAS.
..DRLPYKN	HMGRclustalW{phycomyces}	..... .... .....
.....	HMGRclustalW{ fusarium}	G..KIPGYAL EKTLGDFTRA VKIRRSIIAR NKAAADITHS
LDRSKLPYEN	HMGRclustalW{ candida}	G..KLPLYAL EKQLGDNLRA VAIRRKAISD LADAPVLRs.
..NKLPYLH	HMGRclustalW{dictyoste2}	A..VVAAAEK AATSGEDPSS IQPVVPPTSN LDFEGSLTN.
.....LPVDH	HMGRclustalW{wheat1}	..... .... .....
.....	HMGRclustalW{ rice}	G..ALPSHRL ESRIGDCRRA ARLRREALR. ....RVTGRG
..VEGLPFDG	HMGRclustalW{ corn}	G..KVPSYAL EARLGDCRRA AGIRREALR. ....RITGRD
..IEGLPLDG	HMGRclustalW{wheat3}	..... .... .....
.....	HMGRclustalW{wheat2}	..... .... .....
.....	HMGRclustalW{ soybean}	..... .... .....
.....	HMGRclustalW{rubbertre3}	G..SIPSYSL ESKLGNCRRA ALIRRETLQ. ....RMSGRS
..LEGLPLDG	HMGRclustalW{rosyperiwi}	G..KIPSYSL ESKLGDCRRA AGIRREALQ. ....RITGKS
..LEGLPLEG	HMGRclustalW{ tomato}	G..KIPSYSL ESKLGDCRRA ASIRKEVMQ. ....RITGKS
..LEGLPLEG	HMGRclustalW{woodtobacc}	G..KMPSYSL ESKLGDCRRA ASIRKEALQ. ....RITGKS
..LEGLPLEG	HMGRclustalW{ potato}	G..KTPSYSL ESKLGDCMRA ASIRKEALQ. ....RITGKS
..IEGLPLDG	HMGRclustalW{ radish}	G..VVPSYSL ESRIGDCRRA ASIRREALQ. ....RLTGRS
HMGRclustalW{arabadopsis1}	HMGRclustalW{arabadopsis1}	G..VIPSYSL ESRIGDCRRA ASIRREALQ. ....RVTGRS
..IEGLPLDG	HMGRclustalW{cucumismel}	G..SVPSYSL ESKLGDPKRA ASIRREALQ. ....RTTGRS
..IHGLPFEF	HMGRclustalW{rubbertre2}	..... .... .....
.....	HMGRclustalW{rubbertre1}	G..KIPSYSL ESKLGDCRRA AAIRREALQ. ....RMTRRS
..LEGLPVEG	HMGRclustalW{camptothec}	G..TTPSYAL ESKLGDSHRA AAIRREALQ. ....RMTKKS
..LAGLPLDG	HMGRclustalW{arabadops2}	G..TIPSYSL ETKLGDCRRA AAIRREAVQ. ....RITGKS
..LTGLPLEG	HMGRclustalW{chineseham}	K..HIPAYKL ETLMETHERG VSIRRQLLST K..LPEPSS.
..LQYLPYRD		

## FIG. 32BB

HMGRclustalW{chineseha2} K..HIPAYKL ETLMETHERG VSIRRQLLST K..LPEPSS.  
 ..LQYLPYRD  
 HMGRclustalW{syrianhamst} K..HIPAYKL ETLMETHERG VSIRRQLLST K..LPEPSS.  
 ..LQYLPYRD  
     HMGRclustalW{    rat} K..HIPAYKL ETLMETHERG VSIRRQLLSA K..LAEPSS.  
 ..LQYLPYRD  
     HMGRclustalW{    rabbit} K..HIPAYKL ETLMETHERG VSIRRQLLSK K..LPEPSS.  
 ..LQYLPYRD  
     HMGRclustalW{    human} K..HIPAYKL ETLMETHERG VSIRRQLLSK K..LSEPSS.  
 ..LQYLPYRD  
     HMGRclustalW{    mouse} .....  
 .....  
     HMGRclustalW{    xenopus} K..HIPAYKL ETMMESPREG VAIRRQMLSD K..LPQRSA.  
 ..LQSLPYKN  
     HMGRclustalW{sea urchin} K..HIPAYKL ENILDNPERG VAVRRQIISK L..LPITDA.  
 ..LEKLPYAS  
     HMGRclustalW{cockroach} G..HIAGYQL EKVVVRNPERG VGIRRQILTK T..ADLKDA.  
 ..LDNLPYKN  
     HMGRclustalW{drosophila} GGTHCPLHKI ESVLDDPERG VRIRRQIIGS R..AKMPVGR  
 ..LDVLPYEH  
     HMGRclustalW{dictyostel} G..EVLAYRL ENELGDCSRA VEIRRMLLEK ....QLSKK.  
 ..IEPIPHEG  
     HMGRclustalW{schistosom} G..RLKTREL ESVVRNPFRA VELRRLDLS. ....TFLNNP  
 HIIERIPYKD  
     HMGRclustalW{archaeoglo} HYKSGKIRRA MSSRIPGFYK LSVEERLKKV AEFAGLSDEE  
 ..VKAVLSQG  
     HMGRclustalW{pseudomonas} .....MS LDSRLPAFRN LSPAARLDHI GQLLGLSHDD  
 ..VSLLANAG  
  
 Consensus    G---IPSYSL ESKLGDKRA VSIRREALSK K--LRITGSS --  
 LEGLPYEG

## FIG. 32CC

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750	
HMGRclustalW{methanobac}	IDMERASRRN IENPIGVVQI PLGVAGPLRV RGEHADGEYY
VPLATSEGAL	
HMGRclustalW{methanococ}	IDEEMAMKKN IENMIGAIQI PLGFAGPLKI NGEYAKGEFY
IPLATTEGAL	
HMGRclustalW{halobacter}	FPAEAAES.A IENMVGSIQV PMGVAGPVSV DGGSVAGEKY
LPLATTEGAL	
HMGRclustalW{sulfolobus}	IDYSEIKNKN AENVIGAIQI PLGIVGPIRV NGDYAKGDFY
VPMATTEGAL	
HMGRclustalW{yeast2}	YDYDRVFGAC CENVIGYMPI PVGVIGPLII DGT....SYH
IPMATTEGCL	
HMGRclustalW{yeast1}	YDYDRVFGAC CENVIGYMPY PVGVIGPLVI DGT....SYH

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FIG. 32DD

IPMATTEGCL		
HMGRclustalW{phycomyces}	.....	.....
PMATTEGCL		
HMGRclustalW{fusarium}	YNWERFFGAC	CENVIGYMPL PVGVAGPLVI DGQ....SYF
IPMATTEGVL		
HMGRclustalW{candida}	YDYDRVFGAC	CENVIGYMPL PVGVAGPLII DGK....PYH
IPMATTEGCL		
HMGRclustalW{dictyoste2}	FDYTKVLGAC	CENVIGYIPI PVGVAGPILL DGK....LVS
IPMATTEGCL		
HMGRclustalW{wheat1}	.....	.....
.....		
HMGRclustalW{rice}	MDYQAILGQC	CEMPVGYVQL PVGVAGPLLL DGR....EYH
VPMATTEGCL		
HMGRclustalW{corn}	FDYASILGQC	CELPVGYVQL PVGVAGPLLL DGR....RFY
LPMATTEGCL		
HMGRclustalW{wheat3}	.....	.....
.....		
HMGRclustalW{wheat2}	.....	.....
.....		
HMGRclustalW{soybean}	.....	.....
.....		
HMGRclustalW{rubbertre3}	FDYESILGQC	CEMAIGYVQI PVGIAGPLLL DGK....EYT
VPMATTEGCL		
HMGRclustalW{rosyperiwi}	FDYASILGQC	CEMPVGYVQL PVGIAGPLLL DGR....EYM
LPMATTEGCL		
HMGRclustalW{tomato}	FNYESILGQC	CEMPIGYVQI PVGIAGPLLL NGK....EFS
VPMATTEGCL		
HMGRclustalW{woodtobacc}	FDYESILGQC	CEMPIGYVQI PVGIAGPLLL DGR....EYS
VPMATTEGCL		
HMGRclustalW{potato}	FDYSSILGQC	CEMPVGYVQI PVGIAGPLLL DGR....EYS
VPMATTEGCL		
HMGRclustalW{radish}	FDYDSILGQC	CEMPVGYIQI PVGIAGPLLL DGY....EYS
VPMATTEGCL		
HMGRclustalW{arabadopsis1}	FDYESILGQC	CEMPVGYIQI PVGIAGPLLL DGY....EYS
VPMATTEGCL		
HMGRclustalW{cucumismel}	FDYESILGQC	CEMPVGYVQI PVGIAGPLLL DGF....EYT
VPMATTEGCL		
HMGRclustalW{rubbertre2}	.....	.....
.....		
HMGRclustalW{rubbertre1}	FDYESILGQC	CEMPVGYVQI PVGIAGPLLL NGR....EYS
VPMATTEGCL		
HMGRclustalW{camptothec}	FDYDSILGQC	CEMPVGYVQI PVGIAGPLLL DGR....EYS
VPMATTEGCL		
HMGRclustalW{arabadops2}	FDYNSILGQC	CEMPVGYVQI PVGIAGPLLL DGV....EYS
VPMATTEGCL		
HMGRclustalW{chineseham}	YNYSLVMGAC	CENVIGYMPI PVGVAGPLCL DGK....EYQ
VPMATTEGCL		
HMGRclustalW{chineseha2}	YNYSLVMGAC	CENVIGYMPI PVGVAGPLCL DGK....EYQ
VPMATTEGCL		
HMGRclustalW{syrianhamst}	YNYSLVMGAC	CENVIGYMPI PVGVAGPLCL DGK....EYQ
VPMATTEGCL		
HMGRclustalW{rat}	YNYSLVMGAC	CENVIGYMPI PVGVAGPLCL DGK....EYQ
VPMATTEGCL		
HMGRclustalW{rabbit}	YNYSLVLGAC	CENVIGYMPI PVGVVGPLCL DGK....EFQ
VPMATTEGCL		
HMGRclustalW{human}	YNYSLVMGAC	CENVIGYMPI PVGVAGPLCL DEK....EFQ
VPMATTEGCL		
HMGRclustalW{mouse}	.....	.....
.....		
HMGRclustalW{xenopus}	YNYSLVMGAC	CENVIGYMPI PVGVAGPLLL NNK....EYQ

## FIG. 32EE

VPMATTEGCL		
HMGRclustalW{sea urchin}	YDYSFVSGAC CENVIGYMPV PVGVAGPLLL DGQ....EFQ	
VPMATTEGCL		
HMGRclustalW{ cockroach}	YDYLKVMGAC CENVIGYMPV PVGVAGPLNL DGR....LVH	
VPLATTEGCL		
HMGRclustalW{drosophila}	FDYRKVLNAC CENVLGYPPI PVGYAGPLLL DGE....TYY	
VPMATTEGAL		
HMGRclustalW{dictyostel}	FDFAKVQGQC CENVIGYVPI PVGTAGPIQL NGQ....LVT	
IPMATTEGCL		
HMGRclustalW{schistosom}	YDYRLVYQGC CEEVIGYMPI PVGKIGPLLL DGR....SHY	
IPLATTEGCL		
HMGRclustalW{archaeoglo}	.LPLDVADRM IENVIGTFEL PLGIATNFLI DGK....DYL	
IPMAIEEPSV		
HMGRclustalW{pseudomonas}	ALPMDIANGM IENVIGTFEL PYAVASNFQI NGR....DVL	
VPLVVEEPSI		
Consensus		FDY-SVLG-C CENVIGY--I PVGVAGPLLL DGK---EYS
VPMATTEGCL		HMGC <sub>o</sub> A binding

E

## FIG. 32FF

751

800	HMGRclustalW{methanobac}	VASVNRGCSV ITRAGGATVR VTGDSMT.RA PVI RTGSVVE
	ALQLREWIYE	
	HMGRclustalW{methanococ}	VASVNRGCSI ITKCGGATVR VIDDKMT.RA PCLKTKSVVD
	AIKVRDWIRE	
	HMGRclustalW{halobacter}	LASVNRGCSV INSAGGATAR VLKSGMT.RA PVFRVADVAE
	AEALVSWTRD	
	HMGRclustalW{sulfolobus}	IASVNRGIKA VTLSGGVRAK VLKDEMT.RA PVFKFDSIEQ
	IPNFLKFIEE	
	HMGRclustalW{ yeast2}	VASAMRGCKA INAGGGATTV LTKDGMT.RG PVVRFPTLIR
	SGACKIWLDs	
	HMGRclustalW{ yeast1}	VASAMRGCKA INAGGGATTV LTKDGMT.RG PVVRFPTLKR
	SGACKIWLDs	
	HMGRclustalW{phycomyces}	VASTARGCKA INAGGGASTI VIADGMT.RG PCVEFPTILR
	AAACKLWIEN	
	HMGRclustalW{ fusarium}	VASASRGCKA INSGGAAITV LTADGMT.RG PCVAFETLER
	AGAAKWLDS	
	HMGRclustalW{ candida}	VASAMRGCKA INLGGGVTTV LTKDGMT.RG PCVKFPLSLKR
	AGQCKLWLDS	
	HMGRclustalW{dictyoste2}	VASTHRGAKA ITKSGGAKTV LLQSGMT.RA PVCRLPSSIR
	AGELKQWIEN	
	HMGRclustalW{wheat1}	.....
.....	HMGRclustalW{ rice}	VASVNRRVQG HLVSGGAFSV LLRDAMS.RA PAVKLPCPMR
	AAELKAFAEA	
	HMGRclustalW{ corn}	VASTNRGCKA IAESGGATSV VL RDAMT.RA PVARFPTARR
	AAELKAFLED	
	HMGRclustalW{wheat3}	.....
.....	HMGRclustalW{wheat2}	.....
.....	HMGRclustalW{ soybean}	.....
.....	HMGRclustalW{rubbertre3}	VASANRGCKA IYASGGATSV LLRDGMT.RA PVVRFPTAKR
	AADLKFFMED	
	HMGRclustalW{rosyperiwi}	VASTNRGCKA ILASGGANSV LLRDGMT.RA PVVRFGTAKR
	AAELKFYMED	
	HMGRclustalW{ tomato}	VASTNRGCKA IYASGGATCI LLRDGMT.RA PCVRFGTAKR
	AAELKFFVED	
	HMGRclustalW{woodtobacc}	VASTNRGCKA IYASGGATSV LLRDGMT.RA PCVRFGTAKR
	AAELKFFVED	
	HMGRclustalW{ potato}	VASTNRGCKA IFVSGGADSV LLRDGMT.RA PVVRFITAKR
	AAELKFFVED	
	HMGRclustalW{ radish}	VASTNRGCKA MYVSGGATST VLKDGMT.RA PVVRFASARR
	ASELKFFLES	
	HMGRclustalW{arabadopsis1}	VASTNRGCKA MFISGGATST VLKDGMT.RA PVVRFASARR
	ASELKFFLEN	
	HMGRclustalW{cucumismel}	VASTNRGCKA IYASGGATSM LLKDGMT.RA PVVRFGSAKR
	ASELKFFLED	
	HMGRclustalW{rubbertre2}	.....
.....	HMGRclustalW{rubbertre1}	VASTNRGCKA IYLSGGATSV LLKDGMT.RA PVVRFASATR
	AAELKFFLED	
	HMGRclustalW{camptothec}	VASTNRGCKA IFACGGATSV LLRDAMT.RA PVVRFGSAKR
	AADLKFFLEN	
	HMGRclustalW{arabadops2}	VASTNRGFKA IHLSGGAFSV LVKDAMT.RA PVVRFPSARR
	AALVMFYLQD	
	HMGRclustalW{chineseham}	VASTNRGCRA IGLGGGASSR VLADGMT.RG PVVRLPRACD
	SAEVKAWLET	

FIG. 32GG

HMGRclustalW{chineseha2}	VASTNRGCRA IGLGGGASSR VLADGMT.RG PVVRLPRACD
SAEVKAWLET	
HMGRclustalW{syrianhamst}	VASTNRGCRA IGLGGGASSR VLADGMT.RG PVVRLPRACD
SAEVKAWLET	
HMGRclustalW{ rat}	VASTNRGCRA ISLGGGASSR VLADGMS.RG PVVRLPRACD
SAEVKSWLET	
HMGRclustalW{ rabbit}	VASTNRGCRA ICLGGGASSR VLADGMT.RG PVVRLPRACD
SAEVKAWLET	
HMGRclustalW{ human}	VASTNRGCRA IGLGGGASSR VLADGMT.RG PVVRLPRACD
SAEVKAWLET	
HMGRclustalW{ mouse}	.....
.....	.....
HMGRclustalW{ xenopus}	VASTNRGCRA IMLGGGAKSR VLADGMT.RG PVVRLPTACD
AAEVKAWLDS	
HMGRclustalW{ sea urchin}	VASTNRGCRA LRSAGGIHSV LIGDGMT.RG PLVRLPSAQE
AGAIKQWLEV	
HMGRclustalW{ cockroach}	VASTNRGMRA LMRCG.VTSR IVADGMT.RG PVVRFPNIDR
ASEAMLWMQV	
HMGRclustalW{ drosophila}	VASTNRGCKA LSVRG.VRSV VEDVGMT.RA PCVRFPVAR
AAEAKSWIEN	
HMGRclustalW{ dictyostel}	VASTHRGCKA ITESGGAKCT ITSRGMT.RA PVVRFSDIVK
ASEFVSWIND	
HMGRclustalW{ schistosom}	VASTNRGCRA IFLAGGIKSV VYRDQMT.RA PVVWFPSIID
SVKCIAWIDS	
HMGRclustalW{ archaeoglo}	VAAASNAARM ARESGGFTTD YTGSLMIGQI QVTKLLNPNA
AKFEVLRQKD	
HMGRclustalW{ pseudomonas}	VAAASYMAKL ARANGGFTTS SSAPLMHAQV QIVGIQDPLN
ARLSLLRRKD	
Consensus	VASTNRGCKA I-LSGGATSV VLADGMT-RA PVVRFPSAKR
AAELKFWLED	

## FIG. 32HH

801

850	HMGRclustalW{methanobac}	NM..DALREE AESTTRHGKL VKIDPI.... IVAGSYVYPR
	FVYTTGDSMG	
	HMGRclustalW{methanococ}	NF..ERIKEV AESTTRHGKL IKIEPI.... LIVGRNLYPR
	FVFKTGDAMG	
	HMGRclustalW{halobacter}	NF..AALKEA AEETTNHGEL LDVTP.... YVVGNSVYLR
	FRYDTKDAMG	
	HMGRclustalW{sulfolobus}	NL..EKIRNI ANSTSHHGKL KSITP.... FVLGNNVWLR
	FSFETGDAMG	
	HMGRclustalW{yeast2}	EEGQNSIKKA FNSTSFRFARL QHIQT.... CLAGDLLFMR
	FRTTTGDSMG	
	HMGRclustalW{yeast1}	EEGQNAIKKA FNSTSFRFARL QHIQT.... CLAGDLLFMR
	FRTTTGDSMG	
	HMGRclustalW{phycomyces}	EG.NDIVTNA FNSTSFRFARL RKLKI.... ALAGKLVFIR
	FSTTTGDSMG	
	HMGRclustalW{fusarium}	EAGQDMMKKA FNSTSFRFARL QSMKT.... ALAGTNLYIR
	FKTTTGDSMG	
	HMGRclustalW{candida}	DEGQEEMKKA FNSTSFRFARL QHLQT.... ALAGDLLFIR
	FRTVTGDAMG	
	HMGRclustalW{dictyoste2}	QENFYQVASA FNSTSFRFARL KSIKV.... VIAGRLVYLR
	FKSSTGDAMG	
	HMGRclustalW{wheat1}	.....
	....GDAMG	
	HMGRclustalW{rice}	PANFELLAAT FNRSSRFGRL QDIRC.... ALAGRNLYMR
	FSCITGDAMG	
	HMGRclustalW{corn}	PANFDTLSVV FNRSSRFARL QGVQC.... AMAGRNLYMR
	FSCSTGDAMG	
	HMGRclustalW{wheat3}	.....
	....GDAMG	
	HMGRclustalW{wheat2}	.....
	....GDAMG	
	HMGRclustalW{soybean}	.....
	.....	
	HMGRclustalW{rubbertre3}	PDNFDTIAVV FNKSSRFARL QSVQC.... AIAGKNLYMR
	FSCSTGDAMG	
	HMGRclustalW{rosyperiwi}	TQNFETISVV FNKSSRFAKL QSVQC.... AIAGKNLYIR
	FSCSTGDAMG	
	HMGRclustalW{tomato}	PIKFESLANV FNQSSRFARL QRIQC.... AIAGKNLYMR
	LCCSTGDAMG	
	HMGRclustalW{woodtobacc}	PVKFETLAAV FNQSSRFARL QRIQC.... AIAGKNLYMR
	FVCSTGDAMG	
	HMGRclustalW{potato}	PLNFETLSLM FNKSSRFARL QGIQC.... AIAGKNLYIT
	FSCSTGDAMG	
	HMGRclustalW{radish}	PENFETLAVV FNRSSRFARL QSVMC.... TLAGKNAYVR
	FSCSTGDAMG	
	HMGRclustalW{arabadopsis1}	PENFDTLAVV FNRSSRFARL QSVKC.... TIAGKNAYVR
	FCCSTGDAMG	
	HMGRclustalW{cucumismel}	PSNFDTLAVV FNRSSRFARL QSIRC.... SIAGKNLYVR
	FCCSTGDAMG	
	HMGRclustalW{rubbertre2}	.....
	.....	
	HMGRclustalW{rubbertre1}	PDNFDTLAVV FNKSSRFARL QGIKC.... SIAGKNLYIR
	FSCSTGDAMG	
	HMGRclustalW{camptothec}	PLNFETLAAV FNSSSRFGKL QNIKC.... AIAGKNLYMR
	YSCSTGDAMG	
	HMGRclustalW{arabadops2}	PSNFERLSLI FNKSSRFARL QSITC.... TIAGRNLYPR
	FACSTGDAMG	
	HMGRclustalW{chineseham}	PEGFAVIKDA FDSTSFRFARL QKLHV.... TMAGRNLYIR
	FQSKTGDAMG	

FIG. 32II

HMGRclustalW{chineseha2}	PEGFAVIKDA FDSTSRFARL QKLHV.....	TMAGRNLYIR
FQSKTGDAMG		
HMGRclustalW{syrianhamst}	PEGFAVIKDA FDSTSRFARL QKLHV.....	TMAGRNLYIR
FQSKTGDAMG		
HMGRclustalW{ rat}	PEGFAVVKEA FDSTSRFARL QKLHV.....	TLAGRNLYIR
LQSKTGDAMG		
HMGRclustalW{ rabbit}	PEGFAVIKEA FDSTSRFARL QKLHI.....	SMAGRNLYIR
FQSRTGDAMG		
HMGRclustalW{ human}	SEGFAVIKEA FDSTSRFARL QKLHT.....	SIAGRNLYIR
FQSRSGDAMG		
HMGRclustalW{ mouse}	.....	.....
.....		
HMGRclustalW{ xenopus}	AEGFKVIKDA FDSTSRFARL GRLQN.....	CVAGRNLYIR
FQSKTGDAMG		
HMGRclustalW{ sea urchin}	PENFAAIKER FESTSRFAKL KSIQT.....	ALAGRYMFLR
FKALTGDAMG		
HMGRclustalW{ cockroach}	PYNFEQIKKN FDSTSRFARL SKIHI.....	RVAGRHLFIR
FIATTGDAMG		
HMGRclustalW{ drosophila}	DENYRVVKTE FDSTSRFGRL KDCHI.....	AMDGPQLYIR
FVAITGDRMG		
HMGRclustalW{ dictyoste1}	TDNYQALKAV FDSTSRFARL SAIKC.....	TIAGRSVYIR
FKCDTGDAMG		
HMGRclustalW{ schistosom}	EEGFQTLKSA FDKTSAHVNL LSVFA.....	CPAGRYIHIR
FAARTGDAMG		
HMGRclustalW{ archaeoglo}	EIIERANECD PMLVNLGGGC KDIEAR.VID TIMGKMLIVH	
LIVDVVKDAMG		
HMGRclustalW{ pseudomonas}	EIIIELANRKD QLLNSLGGGC RDIEVHTFAD TPRGPMLVAH	
LIVDVRDAMG		
Consensus	PENFETLK-A FNSTSRFARL QSIQC-----	AIAGRNLYIR
FSCSTGDAMG		

NADH binding domain 1

(continued)

FIG. 32JJ

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## FIG. 32KK

HMGRclustalW{chineseha2}	MNMISKGTEK ALLKLQEF... . . . FPEMQILA VSGNYCTDKK
PAAINWIEGR	
HMGRclustalW{syrianhamst}	MNMISKGTEK ALVKLQEF... . . . FPEMQILA VSGNYCTDKK
PAAVNWIEGR	
HMGRclustalW{ rat}	MNMISKGTEK ALLKLQEG... . . . VPELQILA VSGNYCTDKK
PAAINWIEGR	
HMGRclustalW{ rabbit}	MNMISKGTEK ALSKLHEY... . . . FPEMQILA VSGNYCTDKK
PAAVNWIEGR	
HMGRclustalW{ human}	MNMISKGTEK ALSKLHEY... . . . FPEMQILA VSGNYCTDKK
PAAINWIEGR	
HMGRclustalW{ mouse}	.....EK ALLKLQEF... . . . FPDMQILA VSGNYCTDKK
PAAINWIEGR	
HMGRclustalW{ xenopus}	MNMISKVTEQ ALARLQEE... . . . FPDLHVL A VSGNYCTDKK
PAAINWIEGR	
HMGRclustalW{ sea urchin}	MNMISKGTEQ ALHALQTM... . . . FPNIEIMS LSGNYCTDKK
VAAINWIEGR	
HMGRclustalW{ cockroach}	MNMLSKGTEV ALAYVQQV... . . . YPDMEILS LSGNFCTDKK
PAAVNWIEGR	
HMGRclustalW{ drosophila}	MNMVSKALRW PFAEFTLH... . . . FPDMQIIS LSGNFCCDKK
PAAINWIKGR	
HMGRclustalW{ dictyoste1}	MNMVSKGV EA VLEHLKII... . . . FDDMTLLS ISGNMCTDKK
PSSINWTEGR	
HMGRclustalW{ schistosom}	MNMVSKATDS ALHCLKY... . . . FSNMQVIS LSGNMCTDKK
PATINTILGR	
HMGRclustalW{ archaeoglo}	ANAVNTMCEK VAPFIERITG . GKVYLRIIS NLAAYRLARA
KAVFDKDVIG	
HMGRclustalW{ pseudomonas}	ANTVNTMAEA VAPLMEA ITG . GQVRLRILS NLADLRLARA
QVRITPQQLE	
Consensus	MNMVSKGV EN VL--LQED-- -GFPDM DVIS ISGNYCTDKK
PAAVNWIEGR	

NADH binding domain 1 (concluded)

## FIG. 32LL

901

950		
HMGRclustalW{methanobac}	GKSITAEITV PGEMVESVLK TTPEAVVEVN TAKNLIGSAA	
AG..SMG.FN		
HMGRclustalW{methanococ}	GKSIVAEVFL TEKEVNKYLK TTSQAIAEVN RLKNYIGSAI	
SN..SMG.FN		
HMGRclustalW{halobacter}	GRSVTADVRI PREVVEERLH TTPERGRELN TRKNLVGSAK	
AA..SLG.FN		
HMGRclustalW{sulfolobus}	GKTVLAEALI KKDVIRNILH SNAQLIHDIN LRKNWLGTAR	
AG..SLSQFN		
HMGRclustalW{yeast2}	GKSVVAEATI PGDVVKSVLK SDVSALVELN ISKNLVGSAM	
AG..SVGGFN		
HMGRclustalW{yeast1}	GKSVVAEATI PGDVVRKVLK SDVSALVELN IAKNLVGSAM	
AG..SVGGFN		
HMGRclustalW{phycomyces}	.....	
.....	.....	
HMGRclustalW{fusarium}	GKGVVAEAI PGEVVRSLVK SDVDSLVELN VAKNLIGSAM	
AG..SVGGFN		
HMGRclustalW{candida}	GKSVVAEASI PKDAVVKVLK SSVKAVVDVN VNKNLIGSAM	
AG..SVGGFN		
HMGRclustalW{dictyoste2}	GKSVVAEAVI SGDIVRDVLK TTVEALVSLN IDKNLIGSAM	
AG..SIGGFN		
HMGRclustalW{wheat1}	GKSVVCEATI KGRVVQSVID TTVEKLVELN IIKNLAGSAV	
AG..ALGGFN		
HMGRclustalW{rice}	GKSVVCEAI KGDVVQKVLK TTVEKLVELN IIKNLAGSAV	
AG..ALGGFN		
HMGRclustalW{corn}	GKSVVCEAVI GEEVVKVLK TDVQSLVELN TIKNLAGSAV	
AG..ALGGFN		
HMGRclustalW{wheat3}	GKSVVCEAVI REELLKKVLK TNVQSLVELN VIKNLAGSAV	
AG..ALGGFN		
HMGRclustalW{wheat2}	GKSVVCEAI REEVVEKVLD TNVQSLVELN VIKNLAGSAV	
AG..ALGGFN		
HMGRclustalW{soybean}	..... LK TNVSALVELN MLKNLAGSAV	
AG..ALGGFN		
HMGRclustalW{rubbertre3}	GKSVVCEAI KEEVVKVLK TNVAALVELN MIKNLTGSAM	
AG..SLGGFN		
HMGRclustalW{rosyperiwi}	GKSVVCEAI KEEIVKVLK TEVAALIELN MVKNLAGSAI	
AG..ALGGFN		
HMGRclustalW{tomato}	GKSVVCEAI TEEVVKVLK TEVAALVELN MLKNLTGSAM	
AG..ALGGFN		
HMGRclustalW{woodtobacc}	GKSVVCEAI TEEVVKVLK TEVAALVELN MLKNLTGSAM	
AG..ALGGFN		
HMGRclustalW{potato}	GKSVVCEAI KEEVVKVLK TEVAALVELN MLKNLTGSAM	
AG..ALGGFN		
HMGRclustalW{radish}	GKSVVCEAVI RGETVNKVLK TSVASLVELN MLKNLTGSAM	
AG..SLGGFN		
HMGRclustalW{arabadopsis1}	GKSVVCEAVI RGEIVNKVLK TSVAALVELN MLKNLAGSAV	
AG..SLGGFN		
HMGRclustalW{cucumismel}	GKSVVCEAVI KDEVVRKVLK TSVASLVELN MLKNLTGSAM	
AG..ALGGFN		
HMGRclustalW{rubbertre2}	GKSVVCEAI KEEVVKVLK TDVALLVELN MLKNLAGSAV	
AG..ALGGFN		
HMGRclustalW{rubbertre1}	GKSVVCEAI KEEVVKVLK TNVASLVELN MLKNLAGSAV	
AG..ALGGFN		
HMGRclustalW{camptotheч}	GKSVVCEAVI KEEVVKVLK TNVASLVELN MLKNLTGSAM	
AG..ALGGFN		
HMGRclustalW{arabadops2}	GKVVCEAFI KAEIVEKVLK TSVEALVELN TLKNLVGSAM	
AG..SLGGFN		
HMGRclustalW{chineseham}	GKTVVCEAVI PAKVVREVLK TTTEAMIDVN INKNLVGSAM	

FIG. 32MM

K

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FIG. 32NN

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1000  
HMGRclustalW{methanobac} AHYANIIGAI FLATGQDEAH IVEGSLGVTI AEERK....  
....GDLYF  
HMGRclustalW{methanococ} AHYANIIGAI FLATGQDEAH IVEGSLGITM AEVED....  
....DGLYF  
HMGRclustalW{halobacter} AHVANVVAAM FLATGQDEAQ VVEGANAITT AEVQD....  
....GDLYV  
HMGRclustalW{sulfolobus} AHFANIVTAI FIATGQDVAQ IVESSSGYTW TEVRG....  
....EDLYI  
HMGRclustalW{yeast2} AHAANLVTAL FLALGQDPAQ NVESSNCITL MKEVD....  
....GDLRI  
HMGRclustalW{yeast1} AHAANLVTAV FLALGQDPAQ NVESSNCITL MKEVD....  
....GDLRI  
HMGRclustalW{phycomyces} .....  
....  
HMGRclustalW{fusarium} AHAANIVAAI FLATGQDPAQ VVESANCITI MKNLN....  
....GALQI  
HMGRclustalW{candida} AQAANMVTAV YLALGQDPAQ NVESSNCITL MTETED....  
....GDLKV  
HMGRclustalW{dictyoste2} AHASNIVTAL YIATGQDPAQ NVESSNCITL MESINGG...  
....KDLYI  
HMGRclustalW{wheat1} AHASNIVTAL FIATGQDPAQ NVESSQCITM LEAVNEG...  
....KDLHI  
HMGRclustalW{rice} AHASNIVTAL FIATGQDPAQ NVESSQCITM LEEVNDG...  
....DDLHI  
HMGRclustalW{corn} AHASNIVTAI FIATGQDPAQ NVESSHCITM LEPVNAG...  
....RDLHI  
HMGRclustalW{wheat3} AHASNIVTAI FIATGQDPAQ NVESSQCIAM LEAVNDG...  
....KDLHI  
HMGRclustalW{wheat2} AHASNIVSAI FIATGQDPAQ NVESSQCITM LEAVNGG...  
....RDLHI  
HMGRclustalW{soybean} AHASNIVSAI FIATGQDPAQ NVESSHCITM MEAINDG...  
....RDLHI  
HMGRclustalW{rubbertre3} AHASNIVTAV YIATGQDPAQ NVESSHCITM MEAVNDG...  
....KDLHI  
HMGRclustalW{rosyperiwi} AHASNIVSAI FIATGQDPAQ NVESSQCITM MEAVNDG...  
....KDLHI  
HMGRclustalW{tomato} AHASNIVSAV FIATGQDPAQ NIESSHCITM MEAVNDG...  
....KDLHI  
HMGRclustalW{woodtobacc} AHASNIVSAV YIATGQDPAQ NIESSHCITM MEAVNDG...  
....KDLHV  
HMGRclustalW{potato} AHASNIVSAV YIATGQDPAQ NVESSHCITM MEAVNDG...  
....KDLHV  
HMGRclustalW{radish} RHASNIVSAV FLATGQDPAQ NVESSQCITM MEAINDG...  
....KDIHI  
HMGRclustalW{arabadopsis1} AHASNIVSAV FIATGQDPAQ NVESSQCITM MEAINDG...  
....KDIHI  
HMGRclustalW{cucumismel} AHSSNIVSAI FIATGQDPAQ NVESSHCITM MEPVNNG...  
....RDLHI  
HMGRclustalW{rubbertre2} AHAGNIVSAI FIATGQDPAQ NVESSHCITM MEAVNDG...  
....KDLHI  
HMGRclustalW{rubbertre1} AHAGNIVSAI FIATGQDPAQ NVESSHCITM MEAVNDG...  
....KDLHI  
HMGRclustalW{camptothe} AHASNIVSAV YIATGQDPAQ NVESSHCITM MEAINDG...  
....KDLHV  
HMGRclustalW{arabadops2} AHSSNIVSAV FIATGQDPAQ NVESSHCITM ILPDGD...  
....DLHI  
HMGRclustalW{chineseham} AHAANIVTAI YIACGQDAAQ NVGSSNCITL MEASGPTN..

FIG. 3200

....EDLYI  
 HMGRclustalW{chineseha2} AHAANIVTAI YIACGQDAAQ NVGSSNCITL MEASGPTN..  
 ....EDLYI  
 HMGRclustalW{syrianhamst} AHAANIVTAI YIACGQDAAQ NVGSSNCITL MEASGPTN..  
 ....EDLYI  
 HMGRclustalW{ rat} LHAANIVTAI YIACGQDAAQ NVGSSNCITL MEASGPTN..  
 ....EDLYI  
 HMGRclustalW{ rabbit} AHAANYVTAI YIACGQDAAQ NVGSSNCITL MEASGPPN..  
 ....EDLYI  
 HMGRclustalW{ human} AHAANIVTAI YIACGQDAAQ NVGSSNCITL MEASGPTN..  
 ....EDLYI  
 HMGRclustalW{ mouse} AHAANIVTAI YIACGQDAAQ NVGSSNCITL MEASGPTN..  
 ....EDLYI  
 HMGRclustalW{ xenopus} AHAANIVTAI YIACGQDAAQ NVGSSNCITI MEATGPTY..  
 ....EDLYI  
 HMGRclustalW{ sea urchin} AHAANTVTAI YIATGQDAAQ NIASSNCITL METRGPKG..  
 ....GDLYL  
 HMGRclustalW{ cockroach} AHAANIVTAI FIATGQDPAQ NVGSSNCITL MEPWGEGD..  
 ....KDLYV  
 HMGRclustalW{ drosophila} AHAANMVTAV FLATGQDPAQ NVTSSNCSTA MECWAENS..  
 ....EDLYM  
 HMGRclustalW{ dictyoste1} AHASNIVTAI FLATGQDCAQ NVESSNCITQ MEACNDG...  
 ....QDLYI  
 HMGRclustalW{ schistosom} AHAANTIAGM FAATGQDLAQ VVDSSSCLTQ LEVDLSD...  
 ....DSLVA  
 HMGRclustalW{ archaeoglo} ..... IATGNDFRA IEAGAHSYAA IGG.YKPLTT  
 YEVDRKGNLV  
 HMGRclustalW{ pseudomonas} ..... VATGNDWRA VEAGAHAYAC RSGHYGSLTT  
 WEKDNNNGHLV

Consensus AHAANIVTAI FIATGQDPAQ NVESSNCITM MEAVNDGN-- -----
 KDLHI

D

## FIG. 32PP

	1001
1050	
HMGRclustalW{methanobac}	AVNLPDVPLA TVGGGTGLET ASECLDIMGV RGGG.....
RVHFAEIVG	
HMGRclustalW{methanococ}	SVTLPDVPIG TVGGGTRVET QKECLEMLGC YGDN.....
KALKFAEIVG	
HMGRclustalW{halobacter}	SVSIASLEVG TVGGGTLPT QSEGDLILGV SGGGDP.AGS
NADALAEACIA	
HMGRclustalW{sulfolobus}	SVTLPSSLEVG TVGGGTRLPT QKEALSIMGV YGSGNP.PGS
NAKKLAETIA	
HMGRclustalW{ yeast2}	SVSMPSIEVG TIGGGTVLEP QGAMLDLLGV RGPHPTEPGA
NARQLARIIA	
HMGRclustalW{ yeast1}	SVSMPSIEVG TIGGGTVLEP QGAMLDLLGV RGPHATAPGT
NARQLARIVA	
HMGRclustalW{phycomyces}	.....
.....	
HMGRclustalW{ fusarium}	SVSMPSLEVG TLGGGTILEP QGAMLDILGV RGSHPTNPGD
NARQLARIIG	
HMGRclustalW{ candida}	SVSMPSIEVG TIGGGTILD P QGSMLELLGV RG.PADVPGE
NARQLAKIVA	
HMGRclustalW{dictyoste2}	SVTMPSIEVG TVGGGTHLPA QSACLDLLKI RGANLERPGA
NSEQLARVVA	
HMGRclustalW{wheat1}	SVTMPPPIEV. ....
.....	
HMGRclustalW{ rice}	SVTMPSIEVG TIGGGTCLAS QAACLNLLGV KGSNHGSPGA
NAGRLATIVA	
HMGRclustalW{ corn}	SVTMPSIEVG TVGGGTQLAS QSACLDLLGV RGASRDRPGS
NARLLATVVA	
HMGRclustalW{wheat3}	SVTMPPPIEV. ....
.....	
HMGRclustalW{wheat2}	SVTMPPPIEV. ....
.....	
HMGRclustalW{ soybean}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGASKESPGS
NSRLLATIVA	
HMGRclustalW{rubbertre3}	SVSMPSIELG TVGGGTQLAS QSACLNLLGV KGASKDSPGS
NSRLLATIVA	
HMGRclustalW{rosyperiwi}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGASKDSPGA
NSRLLATIVA	
HMGRclustalW{ tomato}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGANREAPGS
NARLLATVVA	
HMGRclustalW{woodtobacc}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGANREVPGS
NARLLATIVA	
HMGRclustalW{ potato}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGANRDAPGS
NARLLATIVA	
HMGRclustalW{radish}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGASKESPGM
NSRLLATIVA	
HMGRclustalW{arabadopsis1}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGASTESPGM
NARLLATIVA	
HMGRclustalW{cucumismel}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGASKESPGA
NSRLLATIVA	
HMGRclustalW{rubbertre2}	SVTLPSSIEVG TVGGGTQLAS QSACLNLLGV MGACKESPGS
YSRLLATIVA	
HMGRclustalW{rubbertre1}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGANKESPGS
NSRLLAAIVA	
HMGRclustalW{camptothec}	SVTMPSIEVG TVGGGTQLAS QSACLNLLGV KGASKEAPGS
NARLLATIVA	
HMGRclustalW{arabadops2}	SVSMPCIEVG TVGGGTQLAS QAAACLNLLGV KGSNNEKPGS
NAQQLARIVA	
HMGRclustalW{chineseham}	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
NARQLARIVC	

FIG. 32QQ

HMGRclustalW{chineseha2}	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
HMGRclustalW{syrianhamst}	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
HMGRclustalW{ rat}	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
HMGRclustalW{ rabbit}	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
HMGRclustalW{ human}	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
HMGRclustalW{ mouse}	SCTMPSIEIG TVGGGTNLLP QQACLQMLGV QGACKDNPGE
NARQLARIVC	SCTMPSIEIG TVGGTNLAP QQACLQMLGV QGASTETPGK
HMGRclustalW{ xenopus}	SCTMPSIELG TVGGTVLPP QSACLQMMDV KGSNIHGSGL
NACQLAQIVC	SCTMPSIELG TIGGGTVLPP QAACLDMLGV RGANEMCPGE
HMGRclustalW{ sea urchin}	TCTMPSLEVG TVGGTGLPG QSACLEMLGV RGAHATRPGD
NASQLARIVC	TVTMPSIEVG TVGGTSLPA QSACLDIIGV KGSSSSKPGA
HMGRclustalW{ cockroach}	SVTMCLEVG TVGGTRLSG QRACLDLLDL SV.....D.R
NANTLARIVC	GTIEIPMAVG VIGGATKVNP LAKISLKILG VNTAEELARV AAAL
HMGRclustalW{ drosophila}	GTLEMPMPVVG LVGGATKTHP LAQLSLRILG VKTAQALAEI AVAV
NAKKLAQIVC	SVTMPSIEVG TVGGTQLAP QSACLNLLGV KGA-KESPGS
HMGRclustalW{ dictyostel}	
NADQLAKTIA	
HMGRclustalW{ schistosom}	
PTEHLSRIIA	
HMGRclustalW{ archaeoglo}	
HMGRclustalW{ pseudomonas}	
Consensus	NADH binding domain 2
NARQLARIVA	

## FIG. 32RR

1051

1100 HMGRclustalW{methanobac} GAVLAGELSL MGALAAGHLA RAHSELGRG. ....  
 ..... HMGRclustalW{methanococ} AAVLAGELSL LGALAAGHLG KAHQELGR. ....  
 ..... HMGRclustalW{halobacter} VGSLAGELSL LSALASRHLs SAHAELGR. ....  
 ..... HMGRclustalW{sulfolobus} STVLSGELNL LAALSNKELG KAHAKLGRAM KV....  
 ..... HMGRclustalW{yeast2} CAVLAGELSL CSALAAGHLV QSHMTHNRK. ..TNKANELP  
 QPS..... HMGRclustalW{yeast1} CAVLAGELSL CAALAAGHLV QSHMTHNRKP AEPTKPNLND  
 ATDI..... HMGRclustalW{phycomyces} .....  
 ..... HMGRclustalW{fusarium} AAVLAGELSL CSALAAGHLV RAHMQHNRSA APSRSTTPGS  
 SHDARLTGHD HMGRclustalW{candida} SIVLSGELSL VSALAAGHLV QSHMQHNRAA AKK....  
 ..... HMGRclustalW{dictyoste2} AAVLSGELSL MSALAAGHLV RSHLKHNRT EAPAPQADTI  
SMTHLNPHSD  
 HMGRclustalW{wheat1} .....  
 ..... HMGRclustalW{rice} GSVVAGRALL LAALASGHLV KSHMMYNRSS KDVAK....  
 ..... HMGRclustalW{corn} GGVLAGELSL LSALAAGQLV KSHMKYNRSS KDVSS....  
 ..... HMGRclustalW{wheat3} .....  
 ..... HMGRclustalW{wheat2} .....  
 ..... HMGRclustalW{soybean} GSVLAGELSL MSAIAAGQLV NSHMKYNRSS KDVTK....  
 ..... HMGRclustalW{rubbertre3} GSVLAGELSL MSAIAAGQLV NSHMKYNRSA KDVSK....  
 ..... HMGRclustalW{rosyperiwi} GSVLAGELSL MSAISAGQLV RSHMKYNRSS KDIRN....  
 ..... HMGRclustalW{tomato} GSVLAGELSL MSAISSLGQLV NSHMKYNRST KDVTK....  
 ..... HMGRclustalW{woodtobacc} GSVLAGELSL MSAISAGQLV KSHMKYNRST KDVTK....  
 ..... HMGRclustalW{potato} GSVLAGELSL MSAISAGQLV KSHMKYNRSI KDISK....  
 ..... HMGRclustalW{radish} GAVLAGELSL MSAIAAGQLV RSHMKYNRSS RDISG....  
 ..... HMGRclustalW{arabadopsis1} GAVLAGELSL MSAIAAGQLV RSHMKYNRSS RDISG....  
 ..... HMGRclustalW{cucumismel} GSVLAGELSL MSAIAAGQLV RSHMKYNRSS RDVSK....  
 ..... HMGRclustalW{rubbertre2} GSVLAGELSL MSAIAAGQLV KSHMKYNRSS KDVSK....  
 ..... HMGRclustalW{rubbertre1} GSVLAGELSL MSAIAAGQLV KSHMKYNRSS KDMRK....  
 ..... HMGRclustalW{camptothe} GSVLAGELSL MSAIAAGQLV NSHMKYNRSN KDVTK....  
 ..... HMGRclustalW{arabadops2} GSVLAGELSL MSAIAAGQLV KSHMKYNRSS RDIGP....  
 ..... HMGRclustalW{chineseham} GTVMAGELSL MAALAAGHLV RSHMVHNRSK INLQD....

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FIG. 32SS

.....  
HMGRclustalW{chineseha2} GTVMAGELSL MAALAAGHLV RSHMVHNRSK INLQD.....  
.....  
HMGRclustalW{syrianhamst} GTVMAGELSL MAALAAGHLV RSHMVHNRSK INLQD.....  
.....  
HMGRclustalW{ rat} GTVMAGELSL MAALAAGHLV RSHMVHNRSK INLQD.....  
.....  
HMGRclustalW{ rabbit} GTVMAGELSL MAALAAGHLV KSHMIHNRSK INLQD.....  
.....  
HMGRclustalW{ human} GTVMAGELSL MAALAAGHLV KSHMIHNRSK INLQD.....  
.....  
HMGRclustalW{ mouse} GTVMAGELSL MAALAAGHLV RSHMVHNRSK INLQD.....  
.....  
HMGRclustalW{ xenopus} STVMAGELSL MAALAAGHLV KSHMVHNRSK INLQD.....  
.....  
HMGRclustalW{sea urchin} ATVMAGELSL MSALAAGHLV KSHMKHNRSA LNIASPLPSI  
DEVATHRRSK  
HMGRclustalW{ cockroach} GTVLAGELSL MSALAAGHLV KSHMRHNRSS VSTSG.....  
.....  
HMGRclustalW{drosophila} ATVMAGELSL MAALVNSDLV KSHMRHNRSS IAVNSAN...  
.....  
HMGRclustalW{dictyoste1} SAVMAGELSL MSALSAGHLM KSHLQYNRAK TN.....  
.....  
HMGRclustalW{schistosom} GTVLAAELSL MAALDTDDLV KAHMFNRAK QSTNSHSCSH  
STTTDNNDNI  
HMGRclustalW{archaeoglo} ..GLAQNFAA LRALATEGIQ RGHMELHARN LAIMAGATGD  
EVDRVVEIMV  
HMGRclustalW{pseudomonas} ..GLAQNGLGA MRALATEGIQ RGHMALHARN IAVVAGARGD  
EVDWVARQLV  
.....  
Consensus GTVLAGELSL MSALAAGHLV KSHMK-NRSS KDVSK-----  
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\*      † ‡ ‡

## FIG. 32TT

1101	
1152	
HMGRclustalW{methanobac}	.....
HMGRclustalW{methanococ}	.....
HMGRclustalW{halobacter}	.....
HMGRclustalW{sulfolobus}	.....
HMGRclustalW{yeast2}	..... NKGPPCKT SALL.....
HMGRclustalW{yeast1}	..... NRLKDGSV TCIKS.....
HMGRclustalW{phycomyces}	.....
HMGRclustalW{fusarium}	QCPRALSVNN VDERRRYSEV KAIDE.....
HMGRclustalW{candida}	.....
HMGRclustalW{dictyoste2}	.....
HMGRclustalW{wheat1}	.....
HMGRclustalW{rice}	.....A ....AS.....
HMGRclustalW{corn}	.....T ....TATEK TRQREVDV.....
HMGRclustalW{wheat3}	.....
HMGRclustalW{wheat2}	.....
HMGRclustalW{soybean}	.....I ....S.....
HMGRclustalW{rubbertre3}	.....I ....TF.....
HMGRclustalW{rosyperiwi}	.....I ....ASSQL ESDS.....
HMGRclustalW{tomato}	.....A ....SS.....
HMGRclustalW{woodtobacc}	.....A ....SS.....
HMGRclustalW{potato}	.....
HMGRclustalW{radish}	.....A ....TTTT.....
HMGRclustalW{arabadopsis1}	.....A ....TTTTT TTT.....
HMGRclustalW{cucumismel}	.....L ....ES.....
HMGRclustalW{rubbertre2}	.....A ....AS.....
HMGRclustalW{rubbertre1}	.....A ....AS.....
HMGRclustalW{camptothec}	.....A ....SS.....
HMGRclustalW{arabadops2}	.....S ....SQVNR.....
HMGRclustalW{chineseham}	.....LQGTCTK KSA.....

## FIG. 32UU

HMGRclustalW{chineseha2}	.....	.....LQGTCTK KSA.....
HMGRclustalW{syrianhamst}	.....	.....LQGTCTK KAA.....
HMGRclustalW{rat}	.....	.....LQGTCTK KAA.....
HMGRclustalW{rabbit}	.....	.....LEGACTK KAA.....
HMGRclustalW{human}	.....	.....LQGACTK KTA.....
HMGRclustalW{mouse}	.....	.....LQGTCTK KAA.....
HMGRclustalW{xenopus}	.....	.....LPGTCTK KAA.....
HMGRclustalW{sea urchin}	SVDFSALKES	SAAAPGTCTA NAS.....
HMGRclustalW{cockroach}	.....S	...EPSTPAC KS.....
HMGRclustalW{drosophila}	.....NP	LNVTVSSCST IS.....
HMGRclustalW{dictyostel}	.....	.....
HMGRclustalW{schistosom}	SNIYDNHNVA	LSSKIPVTDN SDIRESVHSL HVKPFPVKSD
LSVNPEISHY TM		
HMGRclustalW{archaeoglo}	RDGKIRLDYA	KEVLERLRS.....
HMGRclustalW{pseudomonas}	EYHDVRADRA	VALLKQKRGQ.....
Consensus	-----A	<u>---LQGTCTK KAA---</u>
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